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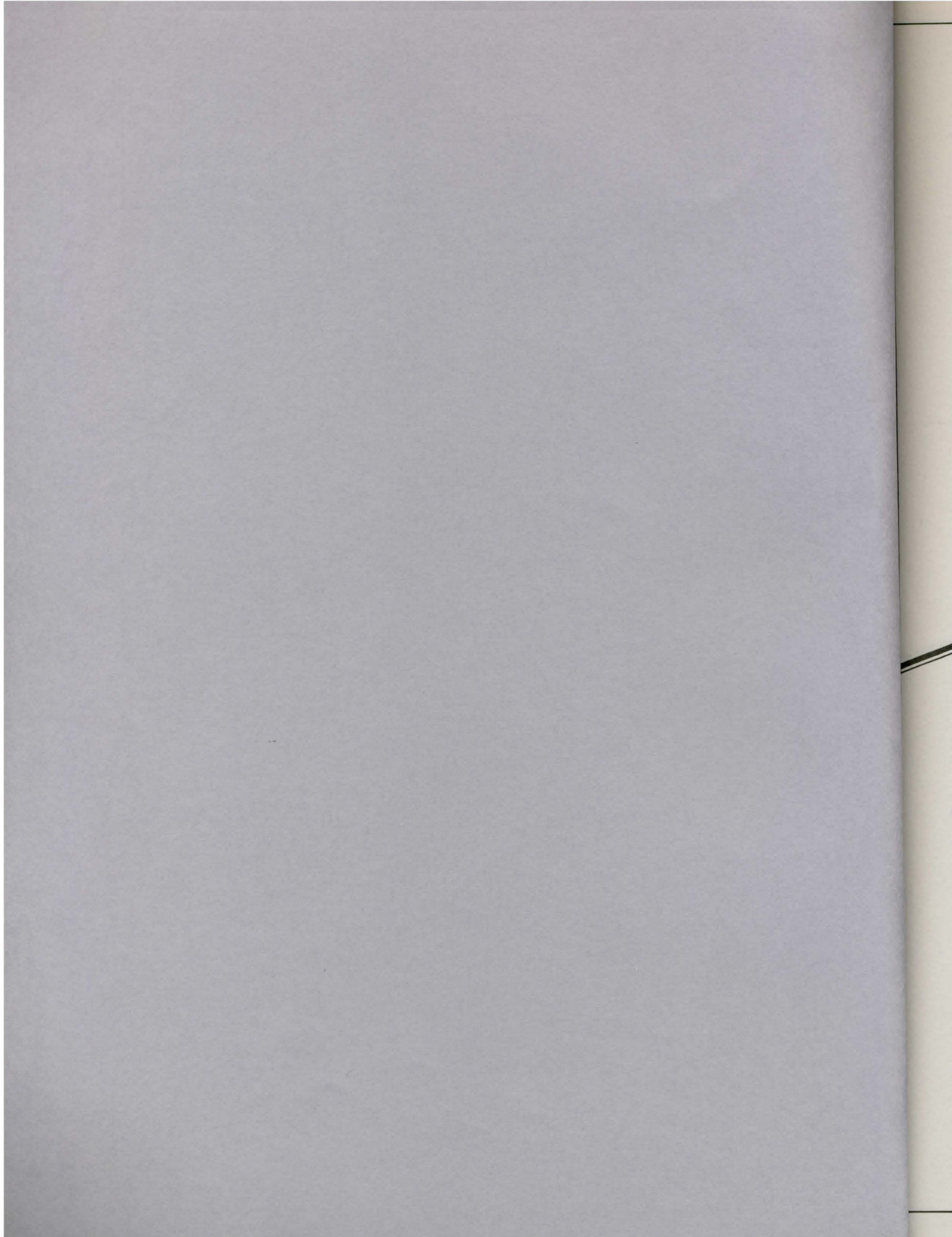
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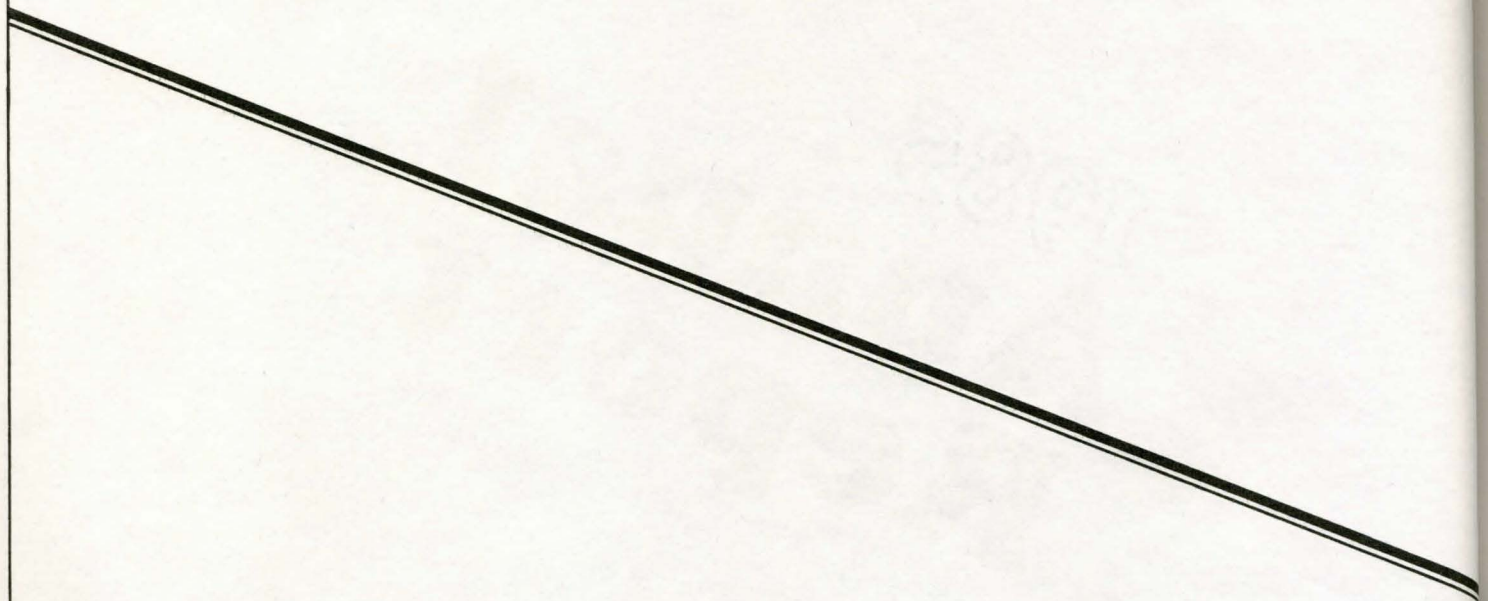
1985 Annual Report

**Missouri Highway
and Transportation
Commission**



1985 **Annual Report**

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and Transportation
Commission**





**Missouri Highway
and Transportation
Commission**

John C. Cozad,
Kansas City, Chairman
Helen T. Schnare,
St. Charles, Vice Chairman
Wm. F. Schierholz,
Des Peres
Paul L. Ebaugh,
Cape Girardeau
C.R. "Dick" Johnston,
Springfield
Donald O. Walsworth,
Marceline

Wayne Muri,
Chief Engineer
Bruce Ring,
Chief Counsel
Mari Ann Winters,
Commission Secretary

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This annual report details the highway and transportation system status and the accomplishments and finances of the Missouri Highway and Transportation Commission for calendar year 1985. The report is assembled in a style meant to provide easy access to needed information. Brief descriptions of the functions of each unit within the Highway and Transportation Department are included.

As required by law, the annual report is distributed free to the governor, the supreme court, the secretary of state, the chief clerk of the House of Representatives, the state library and the legislative

library. House Bills No. 96, 227 and 359, passed in 1983, require our department to charge others who request a copy of the report for the cost of printing and postage.

An informed and interested public is vital to the continuing development and operation of Missouri's highway and transportation programs. The department hopes this report increases taxpayer's understanding of the Missouri Highway and Transportation Department and its administration. Inquiries are welcome.

Organization

Missouri Highway and Transportation Commission

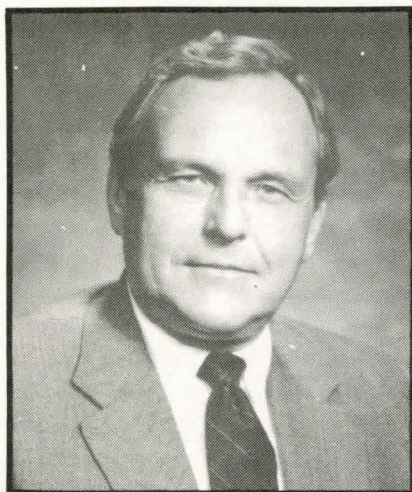
The Centennial Road Law established the first State Highway Commission in 1921. The law created a bi-partisan commission of four people who would each serve six years.

Since 1921, the responsibilities of the department have increased and so has the size of the commission. In 1965, the number of members was increased to six.

The governor, by and with Senate consent, appoints commission members to staggered six-year terms. No more than three members of the commission can belong to the same political party.

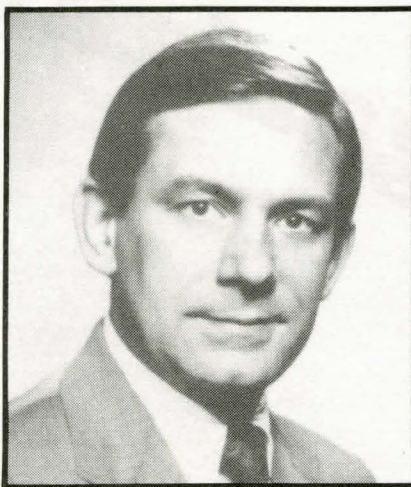
The commission meets at least once a month to hear delegations, establish policies and approve department business. Members appoint the department's chief engineer, chief counsel and secretary to the commission.

Eugene J. Feldhausen



Eugene J. Feldhausen, Platte City, served as chairman of the commission until his term ended in November 1985. He was appointed to a six-year term on the commission by Governor Teasdale in December 1979. Feldhausen was chosen chairman in December 1983. He holds bachelor of science and juris doctor degrees from the University of Missouri, and he is currently practicing law with Feldhausen and Eskridge, P.C.

John C. Cozad



John C. Cozad, Kansas City, is the current chairman of the commission. He was appointed to a six-year term by Governor Ashcroft in November 1985. He was chosen chairman at the December commission meeting. Cozad is a graduate of Westminster College at Fulton. He received his juris doctor degree from the University of Missouri-Columbia, and is currently a partner in the Kansas City law firm of Morrison, Hecker, Curtis, Kuder and Parrish.

Carl E. Yates



Carl E. Yates, Springfield, served as vice chairman of the commission until his term ended in November 1985. He was appointed to a six-year term on the commission by Governor Teasdale in December 1979. He was named vice chairman in December 1983. Yates holds a bachelor of arts degree from Southwest Missouri State University and a juris doctor degree from Washington University. He is currently practicing law with Yates, Mauck and Robinett Inc.

Helen T. Schnare



Helen T. Schnare, St. Charles, is the current vice chairman. She was appointed by Governor Bond to a six-year term on the commission that she began in January 1984. She was chosen vice chairman in December 1985. Schnare received a bachelor of science degree from Southeast Missouri State University and a master's degree from the University of Wisconsin-Madison. She is a former teacher in the St. Charles School District.

William F. Schierholz Jr.



William F. Schierholz Jr., Des Peres, is president of Chemtech Industries Inc. He was appointed to a six-year term by Governor Bond in January 1982. Schierholz received a bachelor of science degree from Washington University. He also served in the U.S. Army Air Force from 1942 to 1946. He is currently involved in many civic activities in the St. Louis area.

Paul L. Ebaugh



Paul L. Ebaugh, Cape Girardeau, was appointed by Governor Bond to a six-year term, which he began in January 1984. He is a graduate of Baltimore City College and is a former president of Cape Construction Company. Ebaugh is a leader in community affairs in the Cape Girardeau area.

C.R. "Dick" Johnston



C.R. "Dick" Johnston, Springfield, is president of the Missouri Farm Bureau, an organization of some 75,000

member families. He was appointed by Governor Bond to a six-year term, which he began in February 1984. Johnston has served on various councils and boards including the University of Missouri Board of Curators from 1975 to 1982.

Donald O. Walsworth



Donald O. Walsworth, Marceline, is president and chief executive officer of Walsworth Publishing Company, an international corporation that produces high school and college yearbooks. He was appointed to a six-year term by Governor Ashcroft in November 1985. Walsworth is a graduate of the University of Missouri-Columbia. He received his post graduate degree in printing management from Carnegie Tech, Pittsburg, PA.

Missouri Highway and Transportation Department

Missouri's state Highway and Transportation Department shoulders responsibilities of five viable transportation alternatives available to Missourians—highways, aviation, waterways, transit and railroads. Those responsibilities include the total operation of the 32,000-mile highway system, including highway location, design, construction and maintenance.

In addition, the department cooperates and coordinates with owners and operators of the other four modal systems in the development and improvement of airports, rail facilities, ports and the operational cost of transit

systems. Key here also is the administration of state/federal programs and funds available with these modes.

The Highway and Transportation Department became such as of January 1980 when voters decided to merge the previously separate Highway and Transportation Departments by passing Constitutional Amendment No. 2 in November 1979. The department operates under a decentralized organization with the Headquarters Office in Jefferson City. This office provides staff assistance and functional control for the various departmental tasks to the 10 geographic districts of the department.

The divisions within the headquarters office are responsible for bridge design and highway planning for the state. There are no counterparts for

these particular divisions in the districts. Decisions about highway construction, maintenance and operations are made at the district level.

Encompassing about 12 counties, each district contains about 10 percent of the total road mileage in the highway system. A district engineer is responsible for administering all activities in his district.

Transportation modes other than highways are established as units within the headquarters office and report to an Assistant Transportation Director. These units carry out the statewide planning for these modes—there are no counterparts in the districts.

District offices are located in St. Joseph, Macon, Hannibal, Kansas City, Jefferson City, Kirkwood, Joplin, Springfield, Willow Springs and Sikeston.

District 1

3602 N. Belt Highway
P.O. Box 287
St. Joseph, MO 64502

District 5

1511 Missouri Boulevard
P.O. Box 718
Jefferson City, MO 65102

District 9

U.S. Business Rt. 63 North
P.O. Box 220
Willow Springs, MO 65793

District 2

U.S. Route 63
P.O. Box 8
Macon, MO 63552

District 6

329 S. Kirkwood Road
Kirkwood, MO 63122

District 10

U.S. Rt. 61 North of U.S. Rt. 60
P.O. Box 160
Sikeston, MO 63801

District 3

Highway 61 South
P.O. Box 1067
Hannibal, MO 63401

District 7

410 Range Line Road
P.O. Box 1445
Joplin, MO 64802

District 4

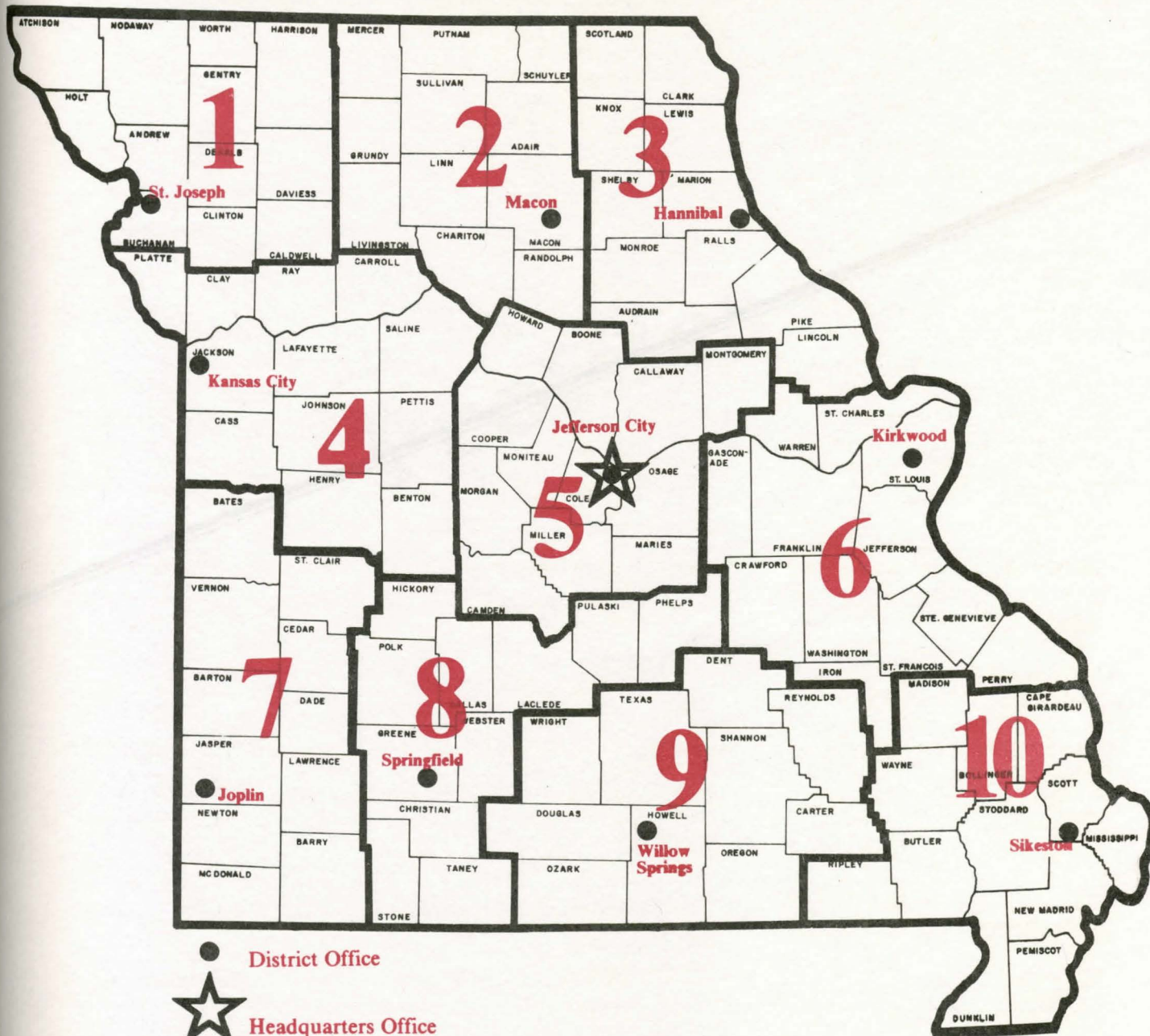
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Kansas City, MO 64128

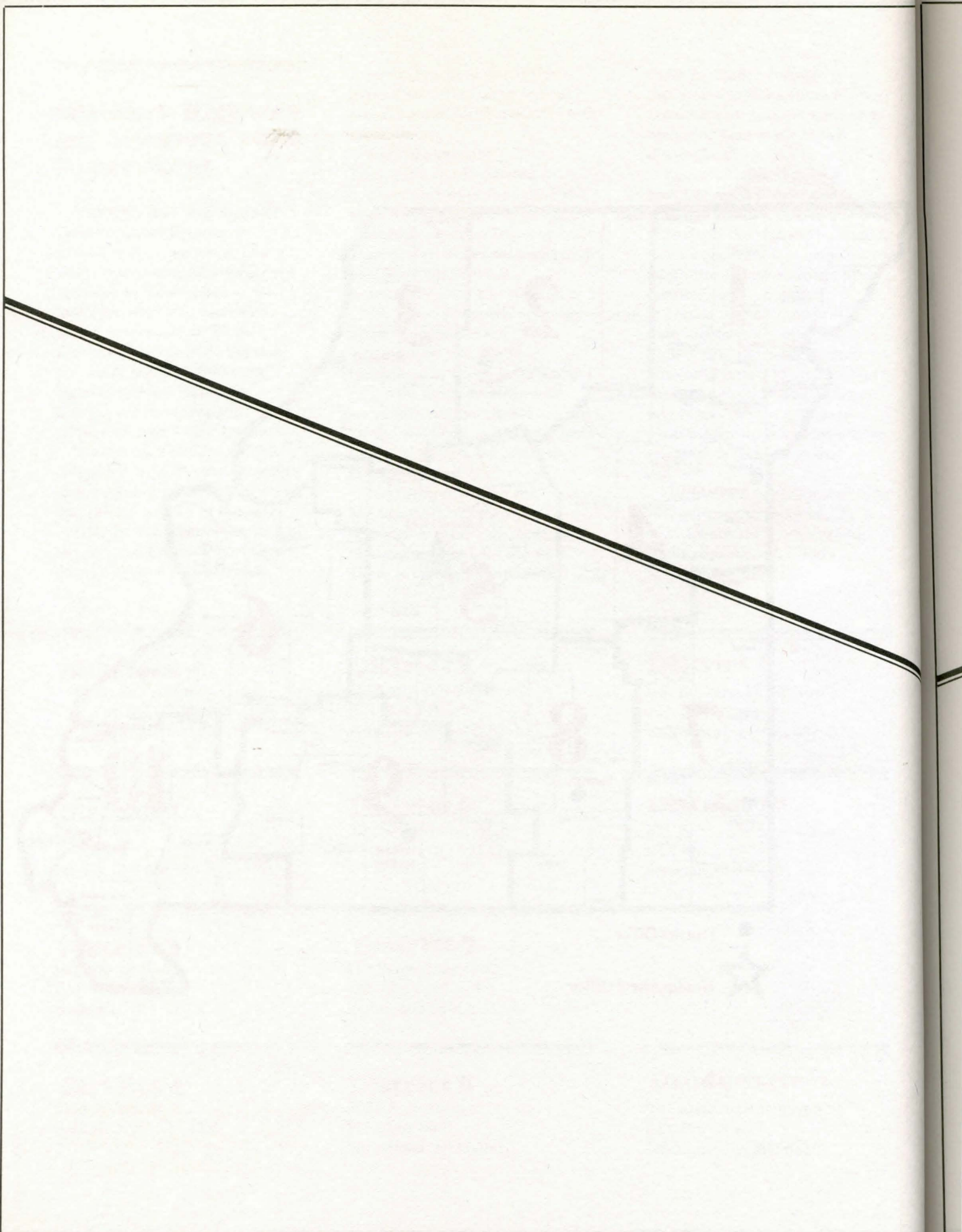
District 8

3025 E. Kearney
M.O. Box 868
Springfield, MO 65801

Headquarters

W. Capitol and Jefferson
P.O. Box 270
Jefferson City, MO 65102







Profiles

**Missouri Highway
and Transportation
Commission**

The Chief

When this photograph was taken, Bob Hunter had just begun what was to be the longest reign of any chief engineer of the Highway Department. It was the beginning of a part of a career that few others would ever experience. It was the beginning of a kind of stress and pressure that most would never know. It was also the beginning of one of the most rewarding times of his life.

"I've always been privileged to serve under some of the people who were insistent on doing the best job that could be done," Hunter says, "and this philosophy has guided me through the years as chief engineer."

He credits his military experience as most directly shaping his personal development along this mold. But as he worked his way up through the department, he continued to work with people who were convinced the agency could be the best there was.

"This was an inspiration to me," he adds, "and I always wanted to carry it on. I've always been proud of our people and proud of what we have been able to accomplish with our resources."

"I've also always had complete faith and confidence in our people," he continues. "They've always known what they were doing, and that's what has enabled me to sleep at night. Sure, we all make mistakes. I've probably made more than anybody. But, regardless, I've felt comfortable with the judgment of the people in this department. I have yet to meet the person I can't learn something from. Take those guys in the field—they know our roads like the back of their hand."

But regardless of his confidence in department personnel, there were still hours of stress and days of pressure, Hunter says. "When I went to District 4 in Kansas City as district engineer, I recall what Chief Engineer Rex Whitton said to me, 'You're going to find this is a lonely world.' And he was right," Hunter adds.

But dealing with this loneliness, this pressure and this stress was something he credits his parents with teaching him. "They saw to it that I grew up in a Christian atmosphere and that my activities and interests were directed towards things like Scouting and DeMolay. Integrity and honesty have always been stressed to me, and that has helped me deal with the rough times."

"I always gathered the best information I could, made my judgment and went forward. I was careful not to let



*Robert N. Hunter, Chief Engineer
Nov. 19, 1970—Dec. 31, 1985*

the pressures make me act in haste or anger. I said what I had to say. I said what I thought was right and let the chips fall where they may. I wasn't going to succumb to the pressures along the way. I was not going to do something that wasn't in the best interest of the people I serve."

But when the pressures did mount up, and at other times to keep them from mounting up, Hunter relied on his exercise program to cope with his stress. His activities normally began daily at 5:30 a.m. and included a variety of exercises such as running, swimming, bicycling and weight lifting.

"It's tough to call a spade a spade and to rule with your head and not your heart, but I felt better prepared to take it all on after a good workout. I've had to laugh occasionally, too, especially because I remember when I used to think, 'Gee, I'm glad I don't have the chief's job!'"

But he did get the job, and in spite of the difficult, pressure-filled side of a career topped off by 15 years in the chief engineer's position, Hunter says he likes to focus on the more satisfying moments and experiences throughout his 35 years with the department.

"It was quite a challenge to be involved between 1951 and 1961. The department brought 12,000 miles of

farm-to-market roads into the state system and improved them to meet state standards. It took a lot of extra time and hours, but it's one of my fondest memories," he adds.

"It was also quite a challenge in 1956 when we began work on the Interstate system. This was an entirely new concept. The layout, design and construction were completely new to us. It was especially challenging because we had to develop and change standards as we went."

From a personal point of view, Hunter says his career highlights have also included his work with the highway industry on the national level. He has often appeared

"It's never ceased to be an honor for me to serve the highway users of this country."

—Robert N. Hunter

before members of Congress on behalf of policies and procedures affecting the nation's highway system and has held numerous leadership positions on national highway committees.

"It's never ceased to be an honor for me to serve the highway users of this country," he says. "I've always supported what I honestly felt would be best for all."

Both his work on the national level and his statewide service were never clouded by the unpleasant duties and responsibilities that came with his top post.

"Anything worth doing is worth doing right," Hunter says, "and I've made that one of my directing principles throughout my life. I always want to extract the maximum possible benefit from my efforts."

But there is that other side of the coin, the other side of a chief engineer's career, the side that offers its disappointments.

"My biggest one," Hunter says, "has been the inability of the highway community to secure adequate funding for our programs. There are still some tough odds out there, but this is something that must be conquered."

There was also another time, Hunter adds, that turned out to be a rather bittersweet experience for him.

"This came in the 1970s," he says, "when the department and myself received extremely harsh attacks from the **St. Louis Globe-Democrat** accusing us of not earmarking enough money for the St. Louis area.

"The intense investigation that followed was a difficult time, but when it was all over the investigators concluded that this department's money had been used properly and efficiently. It was as if we overcame the battle and our flag was still waving high in the air."

Maybe such times have been harder than others, but all in all Hunter has guided the department, one that has been free of scandal and blemish, through 15 years,

the most recent overshadowed by a severe revenue crunch. His job was not an easy one, but he continued to set high standards in his office of chief engineer for one of the largest state agencies.

And when looking to the future, he says he still sees a department that will continue to set high standards and achieve such goals. "I feel comfortable about the future of this department, and as long as we continue to select people on a merit basis, we will have fine leadership and direction.

"There are some serious problems," he adds. "I'm concerned about our ability to pay our people what they are worth and to get the needed revenue to adequately care for and improve our system."

You might say, though, that where there's a will, there's a way. And to Bob Hunter, within this organization there will be a way.

And it will be this 'way,' having been directed by a man who truly wanted this department to be the best there was, that leads towards a promising future.

Hunter was guided by his goal to bring Missouri's transportation system up to modern standards and then prepare it for the future. He performed these duties with a dedication found deep inside of himself.

He brought honor, respectability, skill and a keen sense of engineering to his position as chief engineer. He has built an unsurpassed reputation for the Missouri Highway and Transportation Department. He has given his all.

Thank you, Chief.



Senior Engineer III Bob Hunter (left) and Shop Inspector I Al Kroeger were pilots when the department began using aerial photography. This photo was taken June 12, 1958, next to the new Twin Beech aircraft. Hunter was responsible for the establishment of the Photogrammetry Unit in the Surveys and Plans Division.

The Life and Times of Robert N. Hunter

Robert Nelson Hunter served 15 years as the Highway and Transportation Department's eighth chief engineer before retiring Jan. 1, 1986.

He began working for the department as a summer employee in 1946 in District 5 while attending college. During this time, he served as a rodman, engineer inspector I and draftsman.

Following his graduation in 1950 from the University of Missouri-Columbia where he received a bachelor of science degree in civil engineering, he joined the department full time as an assistant plans designer in District 5. While serving that district, he held the positions of plans designer II and III, senior engineer II and district surveys and plans engineer. It was as district surveys and plans engineer that Hunter was transferred to District 4 in 1955. While in District 4, he also served as district engineer assistant.

In 1957, he returned to Jefferson City as a senior engineer III in the Main Office Surveys and Plans Division. In 1960, he was transferred to District 4 as the district engineer.

He returned to the Main Office in 1961 as Surveys and Plans

Hunter has been recognized by his peers for his outstanding performance both statewide and nationally.

Division engineer. Between 1963 and his appointment on Nov. 19, 1970, as chief engineer, he served as an assistant to the chief engineer.

Hunter, a World War II bomber pilot and a retired Reservist, is a Professional Engineer. He is a



Fellow of the American Society of Civil Engineers, a past president of the Missouri Society of Professional Engineers and a past national director of the National Society of Professional Engineers.

Hunter is a past president of the American Association of State Highway and Transportation Officials (AASHTO) and is also a past chairman of the executive committee of the National Academy of Sciences' Transportation Research Board (TRB). He has also served as a member of the American Road and Transportation Builders Association (ARTBA) Board of Directors.

Hunter has been recognized by his peers for his outstanding performance both statewide and nationally with awards like the AASHTO Thomas H. MacDonald Memorial Award and the George S. Bartlett Award for outstanding contributions to highway and transportation progress.

In 1978, he was honored with the National Limestone Institute's Distinguished Service Award for dedicated leadership and service to the development and progress of the nation's transportation systems. He received the Associated General Contractor's (AGC) SIR

Award for service exemplifying the ideals of the construction industry in 1979.

Hunter has also received the TRB Distinguished Service Award for outstanding service to the transportation research field.

Long active in Scouting, Hunter is the first Missourian and one of the first in the nation to be awarded the Distinguished Eagle Scout Award, Scouting's highest adult honor. He has also received the Silver Antelope Award and the Silver Beaver Award. He is past president of the Great Rivers Council, Boy Scouts of America.

Hunter is a Mason and a Rotarian. He has held all offices of the Jefferson City Rotary Club including district governor.

He is active in the advancement of engineering education through his involvement in the University of Missouri College of Engineering Advisory Council and the University Alumni Association. He received the Honor Award for Distinguished Service in Engineering in 1971 from his college alma mater and the Alumni Association of Missouri Faculty/Alumni Award in 1978.

Hunter was presented the Distinguished Alumnus Citation by the Jefferson City Public Schools Alumni Association in 1976.

Hunter is co-chairman of the Joint AASHTO-AGC-ARTBA Cooperative Committee. He serves on the Task Force on Strategic Highway Research program. He is also chairman of the Task Force on Motor Carrier Matters.

Hunter and his wife, Sue, are members of the First United Methodist Church in Jefferson City. They are the parents of three daughters and one son, and they also have three grandchildren.

"Mac" Moves On

It could be said that Lyle McLaughlin's home away from home for the past 36 years has been the Highway and Transportation Department. On Nov. 1 when his retirement became effective, his attention may have turned to other pastimes, but his memories and experiences go with him throughout the years ahead.

The department's assistant chief engineer since 1971 left an office—one that often greeted a visitor with a smell of fresh tobacco—for a new way of life. The old-time photographs that hung on his office wall complimented a man who truly appreciates the advances made in the state transportation system.

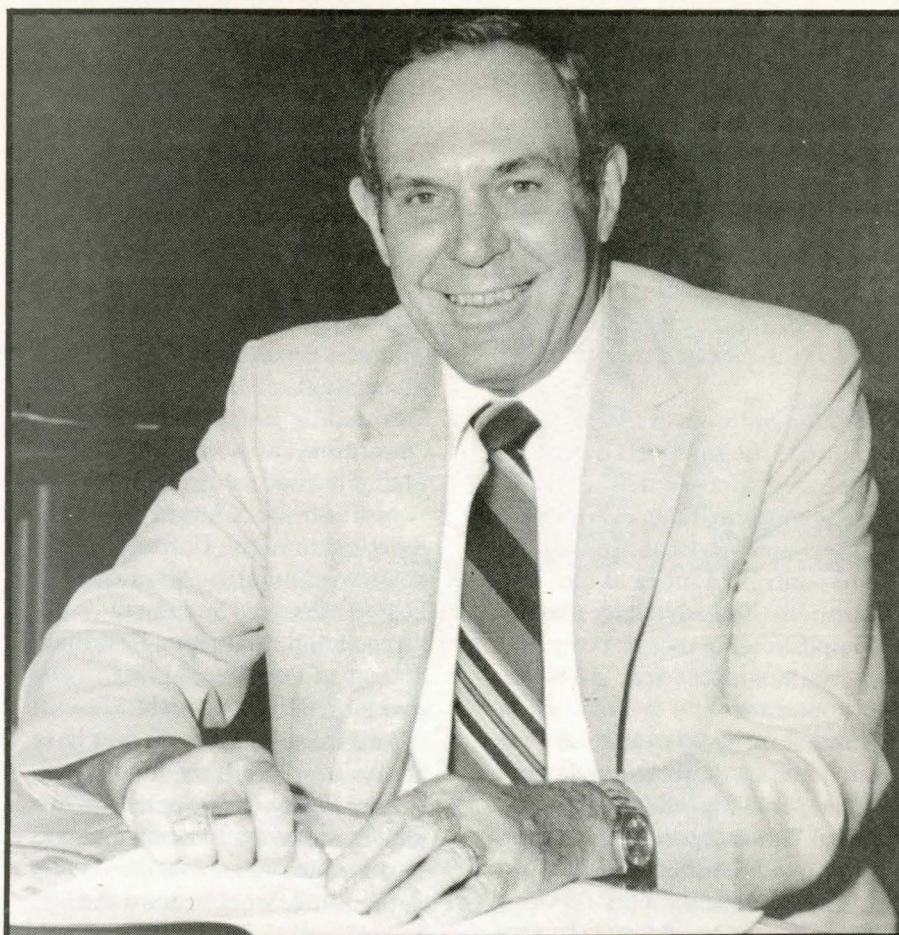
"Mac," as his friends have always called him, had a career that spanned one of the most active times of highway development, and he says he is proud to have been a part of this period. His career was filled with many highlights, but he recalls a couple of special programs that meant a great deal to him.

"I was fortunate to be involved in the 10-year supplementary highway program that began in 1952 and went on for 10 to 12 years when the farm-to-market roads were improved.

"I was also here in 1956 at the beginning of the Interstate system and have seen it virtually completed in this state."

And it was at the beginning of his career that McLaughlin recalls the start of the Jefferson City River Bridge project in 1953. He was a young engineer at this time and assigned to the project as an engineer inspector. The bridge was one of the first major bridges built in the state after World War II.

He laughs when he recalls



*Lyle V. McLaughlin, Assistant Chief Engineer
July 1, 1971—Oct. 31, 1985*

"walking" the top steel beam of that bridge. "This was truly a case where I crawled before I walked," he says. "I know the fingerprints from my grip are still on that top beam! I spent some time sitting until I had the courage to walk. And I was even up on the north end of the bridge, the lowest side!"

McLaughlin later became the resident engineer for that job, which was completed in 1955. He had always liked being where the action was, a reason for his choice of profession.

"I like seeing something completed," he says. "I liked being involved."

But his decision to pursue engineering was not one he had throughout his early days of education in the rural Mercer County schools. And following his

1939 graduation from Harris High School in Sullivan County, McLaughlin served in the U.S. Navy during World War II before completing his engineering education.

He first worked for the department in 1949 as an engineer inspector I in District 5 during the summer months. He then returned to school that fall at the University of Missouri-Columbia where he graduated in 1950 with a bachelor of science degree in civil engineering. He joined the department full time Feb. 1, 1950.

During his career he served in a variety of positions that included engineer inspector I, II and III, project engineer, resident engineer, resident engineer I,

(continued)

district engineer assistant, senior engineer III, District 10 engineer, Main Office Surveys and Plans Division engineer and assistant to the chief engineer-operations. His assignments took him and his family to various places around the state. He served in Districts 5, 8, 9 and 10. And it was these moves, McLaughlin recalls, which shaped his career in a variety of ways.

"Often a move wasn't for a promotion," he says, "but it was a new job and always a new challenge for me. Each move was an opportunity to better myself and to contribute more to the department. The advantages and accomplishments these opportunities created for me were very important.

"I remember real well when I came home from work one day in 1955 and told my wife we were going to Willow Springs, my first major move," he says while grinning. "She said, 'Where's Willow Springs?' and I said, 'I don't know. I think it's south of St. Louis somewhere!'"

He says this was one time the state highway map was very helpful in the McLaughlin household! And so this move was the beginning of an era of moves.

"All of my moves were beneficial to me and my career," he adds. "Each one offered significant experiences, and every new experience is a reward. The Willow Springs move turned out to be one of my more enjoyable assignments. As these moves came, we learned all new locations were interesting places to work and enjoyable places to live because of the people we were associated with."

But since the last move has been "home" for the longest time, the McLaughlins plan to stay in Jefferson City. He and his wife, the former Josie K. Nichols, were married in 1949. They have three sons, David, Paul and James, and

three grandchildren, Melanie, John and Cara.

McLaughlin, 63, is a Professional Engineer and has been actively involved in both professional organizations and community groups throughout his career. He is a member of the American Association of State Highway and Transportation Officials, Highway Engineers Association of Missouri, Memorial Community Hospital Board of Governors, Jefferson City Rotary Club, Masonic Lodge, Moolah Temple Shrine, Alumni Association of the University of Missouri-Columbia, American Legion, Missouri Society of Professional Engineers, National Society of Professional Engineers and First Baptist Church.

And though such activities have always kept him busy, a new variety of day-to-day activities are ahead. McLaughlin says he plans to do some of that ever-demanding "work around the house" and to fish, travel and enjoy his family. "Most of all," he says, "I look forward to doing what I want to do when I want to do it!"

So days will come, and days will go.

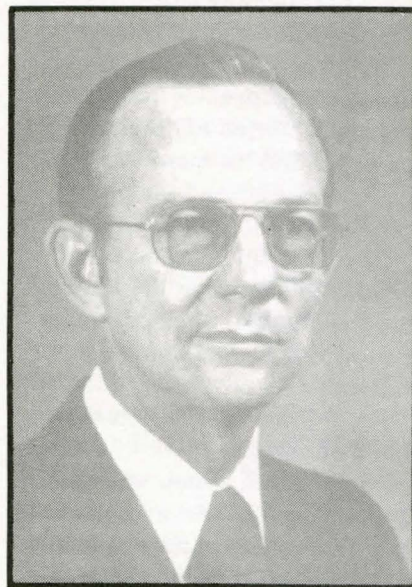
New dreams are being formulated, while others have seen dreams come true.

The department will continue to move forward, and it has such individuals as Lyle McLaughlin to thank for his contributions and dedicated service.

Maybe there is another young engineer out there who will soon be crawling along bridges, moving a family to unknown places and climbing the ladder of success as McLaughlin has done.

Perhaps he should receive a badge of courage or a medal of honor for walking that top beam. Perhaps he already has—it's those memories and rewarding experiences that have been pinned close to his heart.

Leland D. Fletcher Appointed Assistant Chief Engineer



Leland D. Fletcher, former assistant to the chief engineer-planning and design, was promoted to assistant chief engineer Dec. 1. He replaced Lyle V. McLaughlin who retired Nov. 1.

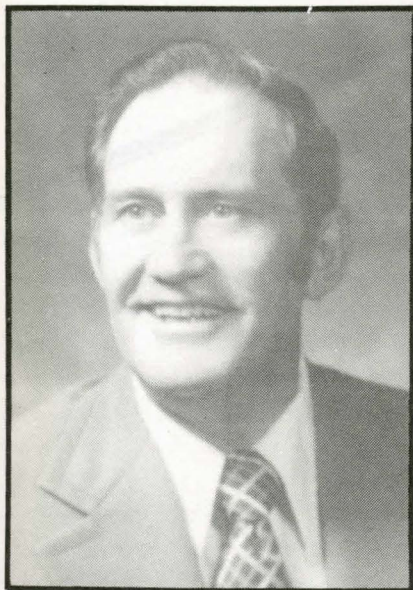
Fletcher, 64, is a 1949 graduate of the University of Arkansas where he received a bachelor of science degree in civil engineering.

He joined the department 35 years ago as an assistant plans designer in District 8. During his career, he has also held the positions of plans designer, plans designer III, chief of party, designer II, district engineer assistant, senior engineer III, District 1 engineer, District 4 engineer, Maintenance and Traffic Division engineer and Surveys and Plans Division engineer. Fletcher has also served in District 3. He was named assistant to the chief engineer-planning and design in November 1970.

Fletcher, a Professional Engineer, was born in Pollard, AR. He graduated from Boydsville High School in 1939. He served in the U.S. Army Air Force from November 1942 to January 1945.

In 1941, he married the former Jane Carpenter of Rector, AR, and they have two children. Fletcher is a member of the Jefferson City West Rotary Club and Wesley Methodist Church.

William H. Shaw Appointed Assistant to the Chief Engineer- Planning and Design



William H. Shaw, former Construction Division engineer, was promoted to assistant to the chief engineer-planning and design Dec. 1. He replaces Leland D. Fletcher who was promoted to assistant chief engineer.

In his new position, Shaw will oversee work in the areas of surveys and plans, bridges, highway planning and right-of-way.

Shaw, 61, is a 1949 graduate of

the Missouri School of Mines-Rolla, where he received a bachelor of science degree in civil engineering.

He joined the department that same year as an engineer inspector II in District 10. During his 36-year career, he has served as engineer inspector III, project engineer, resident engineer, resident engineer I, designer II, senior engineer III, field liaison engineer-maintenance and District 10 engineer. He was promoted to his former position as Construction Division engineer in October 1972.

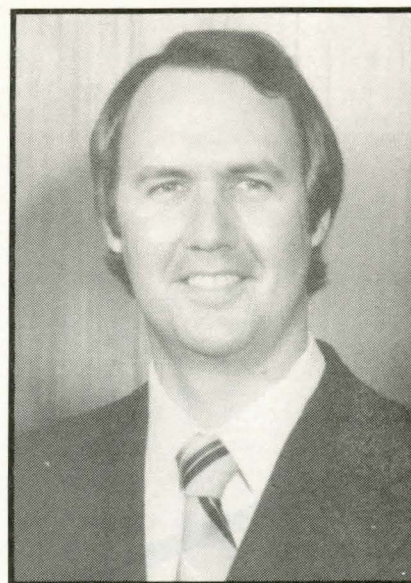
Shaw, a Professional Engineer and Land Surveyor, was born in Illmo, the son of the late William H. and Rose Shaw. He graduated from Illmo High School in 1942. He served in the U.S. Army during World War II in the European Theater of operations.

He was married to the former Marta Jo Sitton of Illmo in 1946, and they have three children. Shaw is a member of Chi Epsilon, a national civil engineering honor society, and the First United Methodist Church. He is a Boy Scout adult leader, having held a variety of positions within the Boy Scouts of America.

Masters Assumes New Duties

Sam Masters, waterways director in the Transportation Section, was named director of railroads, following the resignation of J. Everett Mitchell. He assumed his new duties Aug. 1. Masters continues to serve as director of waterways.

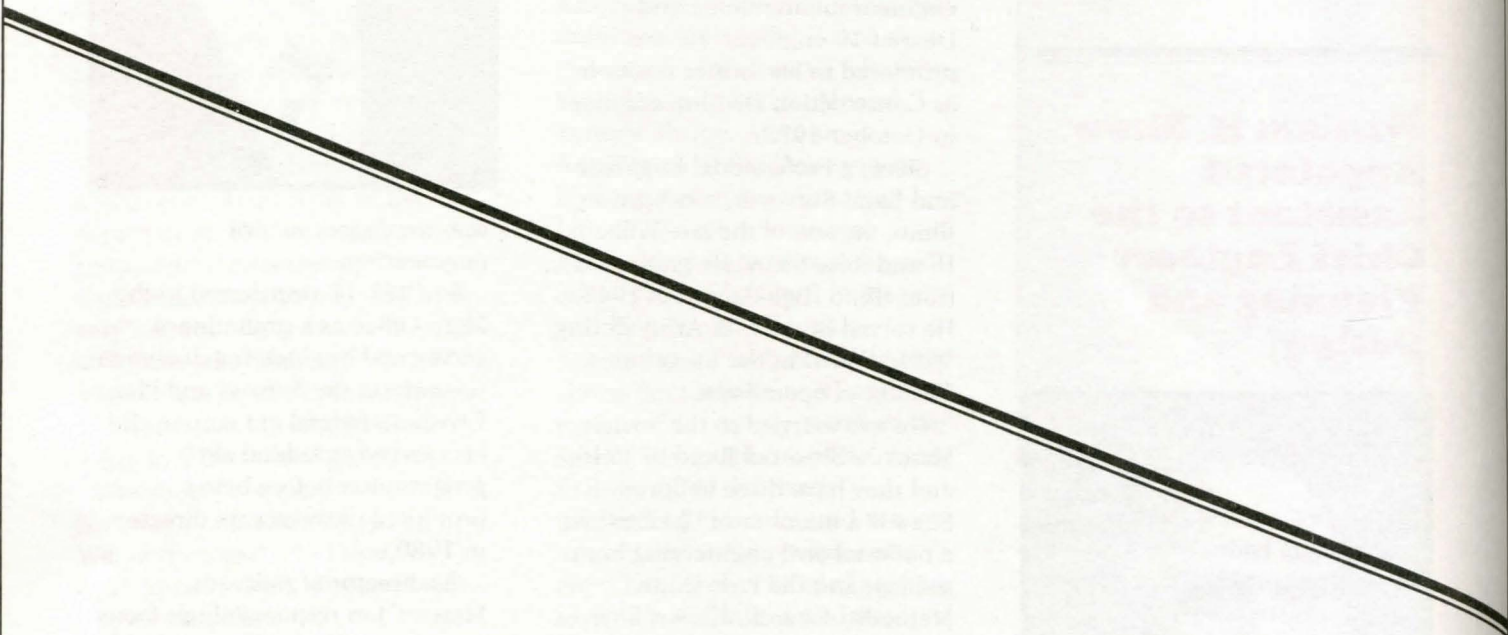
Masters, 34, joined the department in January 1973 as a highway designer in District 5 following his graduation from the University of Missouri-Columbia where he received a bachelor of



science degree in civil engineering.

In 1975, he transferred to the Main Office as a preliminary survey and engineering document reviewer in the Surveys and Plans Division's federal aid section. He also served as federal aid programmer before being promoted to waterways director in 1980.

As director of railroads, Masters' job responsibilities focus on statewide rail planning and Amtrak operations.



Highlights

**Missouri Highway
and Transportation
Commission**

Hunter Announces Retirement; Muri Will Step In

On Sept. 9, 1985, Chief Engineer Robert N. Hunter announced his retirement effective Jan. 1, 1986. Wayne Muri, the department's District 5 engineer, was named by the Highway and Transportation Commission as Hunter's successor.

Hunter said it has been the department's policy that people in upper management step down when they reach age 65. Hunter turned 65 on Dec. 25, 1985. He said he felt he "should abide by the same rules." He was most



Wayne Muri

complimentary of the outstanding departmental staff and expressed his appreciation for the loyalty and service of these people to the highway and transportation users

of this state.

Hunter's retirement brings to a close a distinguished 35-year career that spanned a variety of positions and locations within the department.

Muri, 47, is a Jamestown native. He is a 1960 graduate of the University of Missouri-Columbia where he received a bachelor of science in civil engineering.

During his 25 years with the department, Muri has held a variety of positions in the Surveys and Plans and Maintenance divisions, working in district offices in Jefferson City and St. Louis as well as in the Main Office. Muri, a Professional Engineer, was appointed District 5 engineer in the Jefferson City area in April 1981.

I-70 Series Is a Home Run Hit

The world watched Missouri in late October as the St. Louis Cardinals and the Kansas City Royals battled for the I-70 Show-Me World Series honors.

Though it was the first Series match between the National League Cardinals and the American League Royals, it was not the first all-Missouri Series. In 1944, the St. Louis Cardinals captured the World Series title when they defeated the St. Louis Browns.

But this time around, it was our own Interstate 70 that separated the Cardinal red and the Royal blue. The traffic along this World Series trail was a continual reminder that something quite special was taking place in Missouri.

And to the department, the World Series meant a little bit of extra attention along the

Interstate. In order to assure a pleasant traveling experience for the thousands of baseball fans making the trip back and forth between the two cities, holes were patched and litter was collected. It was exciting to have millions make reference to our highway system!

But on Oct. 27, when those Kansas City Royals became the world champions, there might have been just a bit of pride that

had to be swallowed by many around the department! There was a touch of District 6 versus District 4 in this Series! And some fellow workers had a tough way to go if they were transplants from one side of the state to the other.

But all in all, it was fun being a part of sports history. And it was also nice to share in that special kind of Missouri pride as we "showed" the world our great state.



This blue and red billboard just east of the Higginsville exit told the story to passing motorists on Interstate 70.

New Highway Map Hits the Streets

Two million copies of the new 1985-86 Missouri highway map came off the press during the year. The new map features a color photograph of Main Street in Ste. Genevieve, an eastern Missouri town celebrating the 250th anniversary of its founding, and the state's oldest permanent settlement.

For the first time, the 1985-86 map shows Grand Gulf State Park in Thayer, Weston Bend State Park in Weston and Clarence Cannon Dam and Mark Twain Lake on the Salt River in Missouri's northeastern Ralls County. Missouri Governor John Ashcroft and his message are also featured.

New routes including Interstate 170 in the St. Louis area and Interstate 435 in the north Kansas City area are shown on the map, with more detail provided on the insets. Various stretches of previously two-lane highway throughout the state have been upgraded to four-lane highway and are now designated as such on the map.

In addition to these new features, the map has traditionally shown all state roads, rest areas, tourist information centers, state parks (including those accessible to the handicapped), a mileage chart, towns and populations, emergency phone numbers and the addresses of the department's district offices. It also includes the locations of historical markers, airports with paved runway lengths of 4,500 feet or longer, some hospitals with 24-hour emergency facilities and insets of cities with a population of 20,000 or more—Kansas City, Blue Springs, St. Joseph, St. Louis,

Springfield, Joplin, St. Charles, Sedalia, Columbia, Jefferson City and Cape Girardeau.

This is the third two-year map produced by the department since 1981. This practice was begun as a money-saving measure with each map costing 11 cents.

The department first produced

its own map in 1918. In 1925, the commission passed a motion for free distribution of maps to automobile owners.

Through the years the department's highway map has provided a valuable service to travelers, and the new 1985-86 map continues this tradition.

U.S. 71-71A Bypass at Carthage Opens

Department officials, city and county government representatives and other civic leaders joined together to celebrate the opening of the northern segment of the U.S. 71-71A bypass at Carthage Oct. 22.

During the ceremony, which took place at 3 p.m., State Representative Robert Ellis Young was given the honor of cutting the opening ribbon. Young is a long-time advocate of new highway construction between Kansas City and the Arkansas state line.

The ceremony was held on the north lane exiting from Central Avenue across the new Spring River bridge. A motor caravan drove the length of the new segment following the ceremony.

This segment is the next to the last segment of four-lane highway between Carthage and Interstate 44 at Fidelity. Work on the final segments between Nevada and I-44 was started about nine years ago after four lanes of traffic had been completed to that city.

This segment of the total 8.15-mile relocation is a little more than four miles long. It was completed at a cost of more than \$13 million. The cost of the complete relocation will exceed \$26 million.

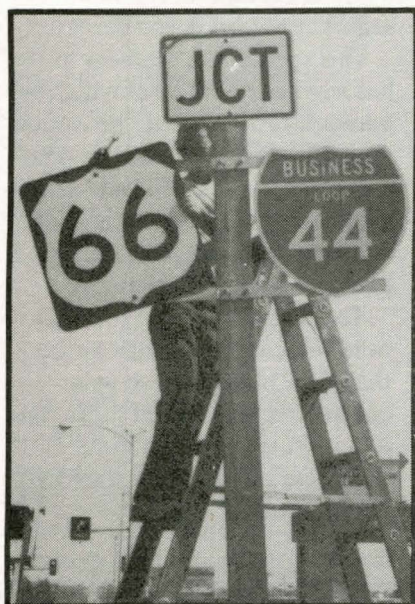


This completed segment of the U.S. 71-71A Carthage bypass project is 4.088 miles long. It officially opened to traffic Oct. 22.

The End of the Road for Route 66

There'll be no more "kicks" on Route 66 in Missouri! On July 24, the Department made a highway marking change on the last remaining section of U.S. Route 66 in the state.

Route 66 markings were replaced with State Route 66 markings from the Interstate 44 Scotland turnoff, about seven miles east of Joplin, to Galena,



Steve Jordan, District 7 maintenance crew member, takes down a U.S. Route 66 sign in Joplin. Missouri Route 66 signs replaced the old ones.

KS at the state line. This change affects about 14 miles of highway.

The department's District 7 Office in Joplin coordinated the route marking change with the Kansas Department of Transportation, which also changed a section of old U.S. Route 66 in Kansas to State Route 66.

Chief Engineer Robert N. Hunter says the change was approved by the American Association of State Highway and Transportation Officials (AASHTO) in keeping with their recent ruling. On June 27, this group's route and numbering committee voted to decertify Route 66 and also voted to remove the route's highway signs.

"We know that Route 66 has a special place in many American's hearts, but progress has passed the route by," Hunter says. "Interstate 44 in Missouri, which runs from St. Louis to the Oklahoma state line, is the primary replacement for Route 66."

This celebrated route of song and screen began its reign in 1926. Its 2,200 miles stretched from the corner of Jackson Boulevard and Michigan Avenue in Chicago to Santa Monica Boulevard in Santa Monica, CA. In Missouri the route wound through towns like Gray Summit, Bourbon, Clementine, Hazelgreen, Strafford, Halltown and Carterville—just to name a few.

But Route 66 couldn't survive the competition from its Interstate counterparts whose construction began in the late 1950s. Over the years the route's mileage had dwindled to only 1,162 miles.

New Look for Route 291 in Jackson County

Motorists had called Route 291 in Jackson County a "death trap" and "blood alley." Its improvements had been debated, rejected and approved. Its funding had been a long time coming.

But now the end had come . . . the end of high accident rates and traffic congestion.

"We're tickled to death that these improvements are finished," Department Chief Engineer Robert N. Hunter said at the opening dedication Aug. 28. Two additional lanes have been added to Route 291 making the former two-lane highway into a safer four-lane divided route.

The improvements were divided into two projects. The first project extended from 39th Street to Hidden Valley Road. Work on this section began March 7, 1983, and it opened to traffic in December 1984. This project included construction of a bridge over the Illinois Central Gulf railroad tracks north of 39th Street.

The second project extended from Hidden Valley Road to north of 23rd Street. This work began May 21, 1985, and was completed in mid-September.

Cooperation between the department and the City of Independence played an important part in the improvements. City officials were instrumental in working with the Missouri General Assembly to acquire some of the project funds from the Third State Building Fund.

The city also built an outer road to accommodate businesses affected by the Route 291 project and helped encourage right-of-way donations along the project route.

The improvements on Route 291 were carried out through the department's District 4 Office in Kansas City under the supervision of District Engineer George Satterlee. Jack Sooter was the construction engineer, and Pete Waugh was the resident engineer on the projects.



Motorists Set New Travel Record

Missouri motorists moved on down the road more in 1985 than in any previous year. Travel during the year was 28.54 billion miles, a 552-million-mile increase over the previous high of 27.99 billion miles driven in 1984.

Travel on the Interstate system increased 261 million miles (2.6 percent), going from 9.88 billion miles in 1984 to 10.14 billion miles in 1985. On the primary system, travel increased 206 million miles (2.2 percent), going from 9.56 billion miles in 1984 to 9.77 billion miles in 1985.

Primary highways are generally

numbered state routes such as 54, 36, 7 and 13.

Travel on the supplementary or farm-to market system increased 85 million miles (1 percent), going from 8.55 billion miles in 1984 to 8.64 billion miles in 1985.

Supplementary highways are generally lettered state routes such as A, B, C and D.

August was the peak travel month in 1985 at 2.67 billion miles, while January was the lowest at 1.90 billion miles.

The overall travel increase is probably due to stable fuel prices, generally mild weather and the use of more fuel-efficient vehicles.

Traffic volume data is obtained from a number of permanent traffic recording stations the department operates throughout the state.

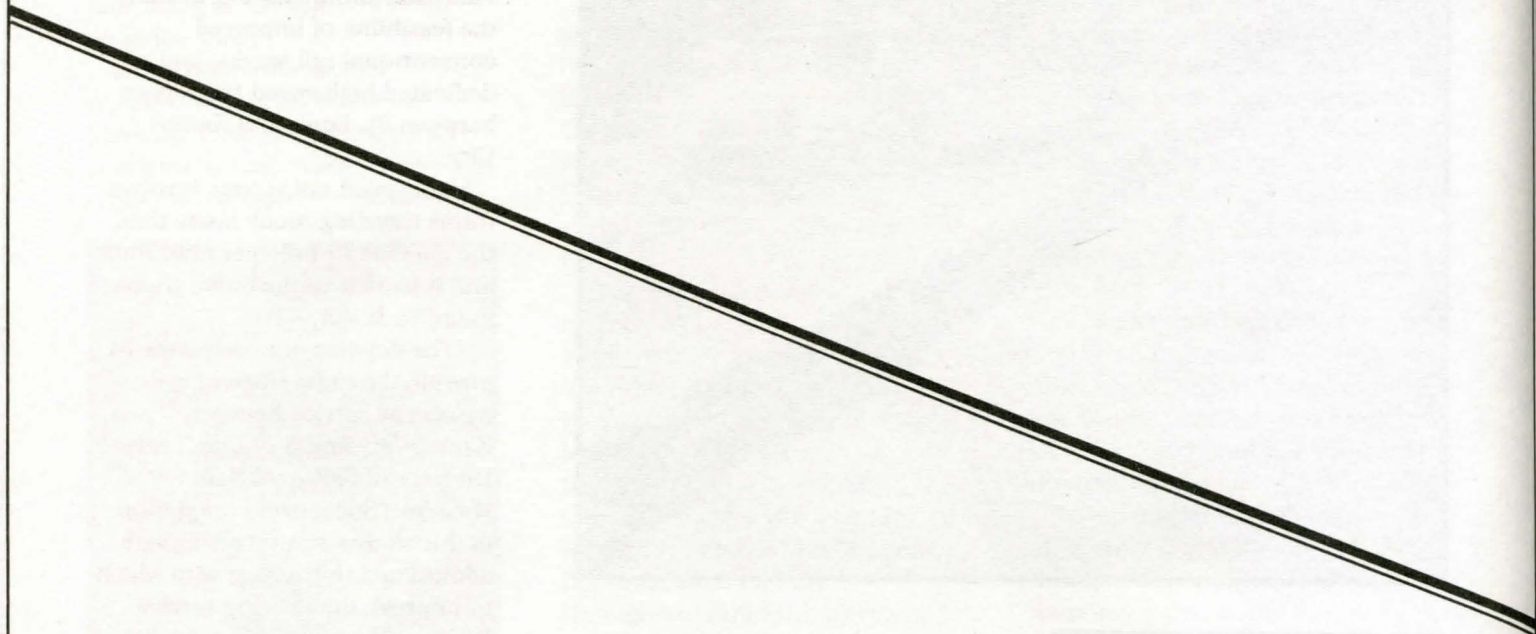
MHTD to Receive High-Speed Rail Grant

The department's Railroads Section got some good news during 1985. It was announced that the department will receive a \$100,000 grant from the Federal Railroad Administration to study the feasibility of improved conventional rail service and dedicated high-speed rail service between St. Louis and Kansas City.

High-speed rail service involves trains traveling much faster than the current 79-mile-per-hour limit and is similar to the bullet trains found in Japan.

"The department endeavors to provide the most efficient rail passenger service between Kansas City and St. Louis," says Director of Railroads Sam Masters. "Successful completion of this study can provide us with additional information with which to improve the existing service. We should receive this grant by the summer of 1986."

The department partially funds rail passenger service from St. Louis to Kansas City, including stops in Kirkwood, Jefferson City, Sedalia, Warrensburg, Lee's Summit and Independence.



Operations

**Missouri Highway
and Transportation
Commission**

Highway Construction Costs Increase 7.4 Percent

If you built a state highway in 1985, you paid 7.4 percent more to do it than you did in 1984, according to figures compiled by the department.

This cost increase is attributable to higher bid prices received on construction materials such as concrete, steel and asphalt and on construction activities such as earthmoving.

During 1985, the department took bids on 332 projects worth \$357.6 million. During 1984, bids were taken on 348 projects worth \$329.2 million.

Construction cost figures are obtained through an index system that assigns point values to several categories of construction activities, not by the number of projects and their corresponding worth.

The number of bids per project decreased from 4.05 per project in 1984 to 3.76 per project in 1985.

The department holds regular highway bid openings monthly except in November.

Restrictions Set on Supplementary System Bridges

Load limits on Missouri's supplementary or farm-to-market highway system bridges were adjusted following commission action on Sept. 6 to use operational restrictions on many of the system's bridges.

Of the 1,627 bridges affected,



about two-thirds will have operational restrictions, while the remaining one-third will have weight limits.

The move came as a result of legislation raising the weight limits of trucks and buses in the state from 73,820 pounds to 80,000 pounds and allowing trucks of this weight to travel up to 10 miles from the primary system.

The operational restrictions imposed on Missouri supplementary bridges fall into three categories: one-way traffic, a 15-mile-per-hour speed limit on the bridge or a combination of the two.

Weight limits and restrictions had previously been approved in January 1984 for bridges on the supplementary system. However, because of the economic impact of restricting the weights on these bridges, the department did a study to determine if the weight limits could be increased by one-way traffic and/or reduced speed limits.

The results of the study indicated that 1,080 of these bridges would be able to carry legal loads if operational restrictions were used.

This commission action, coupled with previously approved bridge postings, resulted in 2,528 bridges out of 6,624 span-type bridges on the state highway system having either a weight limit or an operational restriction.

The Snooper Joins Field Forces

A new kid moved onto the block during the year. He's a big guy, too. It's safe to say he swings his weight around every chance he gets. He has a bit of height in his favor, and he has an uncanny knack for reaching. His name is Snooper.

And you should be looking for him. His name implies just what he will be up to when you find him—snooping around bridges.

Snooper arrived at the department in late August, and he went to work immediately. He makes his home with the field bridge inspectors, but will be traveling throughout the state.

"The Snooper enables us to make an efficient in-depth inspection of our major bridges," says Bridge Maintenance Engineer Bob Gevecker, "because now we can get up close to each bridge." Prior to the Snooper, bridge inspectors relied on boats and binoculars to inspect major river bridges, and then on ladders and scaffolding for close-up inspections.

The Snooper is a \$195,000 piece of equipment manufactured by Paxton-Mitchell Company in Omaha, NE. It is mounted on an International truck. A Paxton-Mitchell project engineer provided three days of classroom and field training for those who would become close companions of the Snooper.

The Snooper's long arm consists of three segments. The second and third are telescoping. On the end of the third segment is a section that can turn 360 degrees in a 20-foot circle. If all segments of the arm were fully extended straight out, the length

would be about 70 feet. However, the distance the arm can reach under a bridge depends on the design of the bridge.

At the end of the arm is the attachment for carrying a bucket or platform for the bridge inspectors. The platform allows more maneuverability, but it can

easily become unlevel. The advantage of the bucket is a built-in device that keeps it relatively level at all times. The bucket and platform hold up to 600 pounds, and both have ample room to carry two people.

There are three speakers on the Snooper. One in the bucket, one

in the truck cab and one on the back of the truck. These allow communication between inspectors stationed near the truck and those in the bucket when the arm is extended under a bridge.

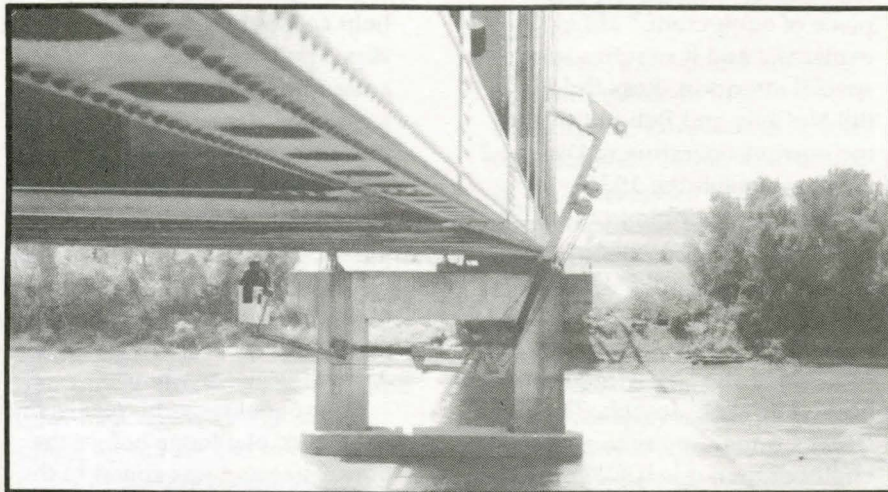
There are also three sets of controls for the Snooper. One is in the bucket, and the other two, one of which is portable, are on each side of the truck behind the cab. The power to operate the Snooper comes from the truck engine. In case of engine failure, an auxiliary pump takes over.

While the arm is extended, a counterweight balance system keeps the Snooper truck from tipping. As the arm rotates at the base, the weights swing to the opposite side of the arm. There are 30 block weights, each weighing 250 pounds, directly behind the truck cab.

The Snooper also has other safety features besides the auxiliary pump and the counterweights. There is a safety switch that keeps the bucket or platform from getting in unsafe positions. There is also a rolling outrigger on each side of the truck that aids in balance when the arm is extended.

As the Snooper travels from bridge to bridge, he is followed by a field office called a "nurse truck." It provides a place for the bridge inspection paperwork and storage of supplies such as a life buoy, inspection tools and ropes.

All in all the Snooper is a rather awesome piece of equipment sure to catch your attention as he works along the highways. As one of the newest members of MHTD, he has made a place he can call his own. He's a nice guy to have around, especially if your business is bridges. And in terms of the field forces, he's become their friend. They understand his workings and cater to his quirks—he's bigger than they are!



The department's Snooper truck allows department field bridge inspectors to get an "up-close and personal" view of the major river bridges. The Snooper's telescoping arm when fully extended can reach about 70 feet.



A Hero Retires

Old snowblowers never die . . . they just move to a retirement home! District 2's veteran of 49 years retired during the year and moved to its new home as an exhibit in the Highway Gardens at the State Fair. And you can be sure it won't be forgotten!

"These snowblowers are the only effective machines for cutting through snowdrifts of 6 feet or larger," G. M. "Jiggs" Miner, maintenance and traffic engineer in District 2 at Macon, explains. "They can open roads when all other efforts fail."

According to Miner, there are now two operating snowblowers in the State—a new 1985 vehicle and a 1962 model that makes its home in District 1.

These 11-ton snowblowers work much the same way as the small domestic units used to clear homeowners' driveways. As the augers in the front of the machine turn, they pull the snow into a fan. The fan forces the snow through a spout that can be directed either left or right, blowing the snow to one or the other sides of the highway.

"The snowblowers are used anywhere throughout the state whenever there is a need," Miner adds. "During the winter of 1983-84, the 1936 unit was used in the Vichy-Rolla area during heavy snows, and it created a lot of

curiosity and even brought out some sightseers.

"The snowblower becomes a hero when it opens up a road! On this particular assignment, the unit worked about 18 hours a day for five days with only minor repairs needed."

And when the snowblower travels, so does the crew of qualified operators. "It's a special piece of equipment," Miner explains, "and it requires some special attention. Russ Holder, Bill McCully and Bob Smith are the current operators in District 2 who have taken the 1936 snowblower over many miles." Another District 2 veteran operator of the unit is Darald "Wimpy" Kelley.

When the 1936 snowblower first joined the Department, its home was in St. Joseph. The District 1 maintenance and traffic engineer then was R.J. "Fat" Ervin and the District 1 garage foreman was J.N. "Prunes" Blackburn. Those in District 1 who worked with the "old snow-go" were Leroy Fones, Chalmer Loomis Jr., Raymond Halter, Harold "Honey" Van Buren, Bisil "Pappy" Fisher and Bill Boor.

Before arriving in Macon in 1968, the 1936 vehicle spent a few years in District 4 at Kansas City. Bill Crippen, Harlen Hicks, Jack Chrisman, Russell Warren, Wayne Slover, Howard K. "Andy" Anderson and Joe Foley took the

snowblower across many miles of highway during those year.

And those long, cold hours spent operating the 1936 machine have left the operators with many stories to tell. Department veteran Bill Boor, currently a maintenance area supervisor in District 1, recalls a 1959 experience with the blower.

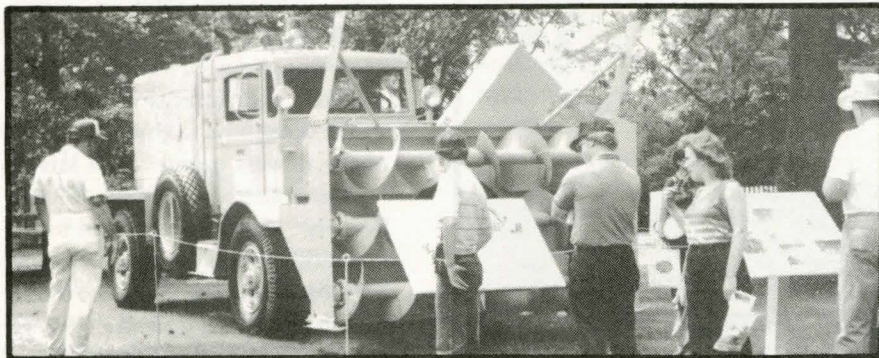
"We left St. Joseph at 3 p.m. to help get some schoolkids out," he says, "and we ended up being gone from home 42 hours. We went southeast about 70 miles to Braymer. A cafe there that had closed even opened up for us to get something to eat. If we were blowing snow we were often able to move only about one mile an hour. When we were deadheading, the top speed was 35 to 40 miles per hour."

Boor chuckles as he recalls the operators' challenge before the power steering was added to the unit. "When we got ready to make a turn, it took one man to push the wheel and another to pull the wheel."

Some things have changed since then, Miner adds, but not everything. The new 1985 snowblower took the place of the 1936 snowblower at a cost of \$125,000. The old snowblower cost only \$15,000 when it was new.

However, the new snowblower was supplied by the same manufacturer as the old. "Some parts listed in the new parts list even carry the same numbers as the old 1936 model," Miner says.

The 1936 snowblower may have been replaced, but it's not a case of out of sight, out of mind. In its first year on exhibit at the State Fair, the Snow-go received plenty of special attention from young and old alike. And rightfully so . . . after 49 years of dedicated work and service, such a hero deserves a special spot where it can be admired and appreciated.



The 1936 snowblower attracts plenty of well-deserved attention on exhibit at the State Fair in Sedalia.

Concern Creates Characters

Two new employees joined department ranks during 1985--"Bungling Bill" and "Iam Careful." "Bill" has a bit of difficulty doing anything safely, while "Iam" can boast of doing everything safely.

"Bill" and "Iam" are the brainchildren of Larry Meisel, District 5 maintenance superintendent. And they have become good friends of maintenance personnel around the state since they started popping up on bulletin boards in the maintenance buildings.

"Safety is always a concern," Meisel says, "so I was looking for a new way of approaching the same information." With this idea in mind, Meisel set out to develop a series of posters reminding maintenance personnel of some of the day-to-day dangers they face in their jobs.

The artwork for the posters was done by Artist Coby Coffman, Main Office Planning Division, and Meisel credits co-worker Bob Jacobs, also a District 5 maintenance superintendent, with actually naming "Bungling Bill."

According to C.F. Barnes, insurance supervisor in the Main Office Accounting Division, whose office handles worker's compensation and processes all insurance claims, the most



**Bungling
Bill**

frequent type of accidents varies depending on the season. Although, he says, since January 1984, the most common accidents have been strains and lacerations.

"Carelessness causes most of the accidents we have," Barnes adds. "Work becomes routine for the employees, and they forget they are continually exposed to danger."

Lost-time accidents are a constant threat to the department, Barnes says. A lost-time accident is one that results in the employee being unable to come to work. "We lose the employee in terms of the availability of having them on the job, and this is a cost to the department."

The department's road crews are continually faced, not only with a certain amount of danger from the machinery and equipment they use, but also from the general public. Roadside work

**Iam
Careful**



places employees in a vulnerable position, says Assistant to the Chief Engineer Operations Carl Klamm, the department's safety coordinator. "The last fatality the department experienced was in November 1983, and our employees are to be praised for their attention to safety along the highways."

So as "Bill" and "Iam" join in the department's work, hopefully all employees will give them a warm welcome and take heed of their messages. Safety is no accident. It deserves careful attention—attention that may save a life or a limb.

Concentrating on Capacity

About 80 department employees went back to the classroom for the Highway Capacity Workshop during the year. The group met at the University of Missouri-Columbia. Half attended the first session Nov. 19-21, and half attended the second session Dec. 10-12.

The workshop was organized by the University's extension services. The topic of concentration and instruction

Employees from all areas of the department reviewed the contents of the Highway Capacity Manual.

was the new Highway Capacity Manual prepared by the Transportation Research Board in Washington, D.C.

"Highway capacity," says Surveys and Plans Urban Engineer Tom Holt, "includes such things as lane needs and signal timing. One of the changes in this manual is the method of computing lane capacity. Another major change is in determining the capacity of signalized intersections."

Employees from all areas of the department and from all corners of the state reviewed the contents of the manual. Course instruction was provided by civil engineering instructors from the University's engineering school.

"The last edition of the manual," adds Assistant Surveys and Plans Division Engineer Owen Redel, "was printed in 1965, and the last workshop the department had was in December 1967 and January 1968. We like to have a refresher course for our employees following a new edition of the manual."

Diamonds in the Rough

Diamonds are a girl's best friend . . . but they can also be friend of the department! For the first time on a major project under contract, the department used a diamond grinding technique to refurbish a section of pavement during the year.

This technique allows the department to repair sections of highway where the pavement quality is still good, but the joints where the pavement sections come together have become uneven. To motorists, these uneven joints can be the "thump, thump" you hear as you drive the highway.

Burlington Pavers Inc., Burlington, WI, was the contractor on this 3.6-mile-long project on Route 71 in District 7. Work was done between Webb City and Carthage on sections of



The diamond grinding machine has a frame made of lead to increase the weight and force of the cutting head as it carves the pavement. The machine travels about 8 to 10 feet per minute while it's cutting.

the north and southbound lanes. The contractor began work near the end of October and finished by the end of December.

According to Jack Thurston, Construction field liaison engineer, the diamond grinding "improves the profile of the pavement," and that doesn't mean a nose job or a wrinkle tuck! What it does mean is that as the machine carves grooves in the pavement, it grinds off the bumps and smoothes the surface. "It gives it a new texture," Thurston says.

The alternative repair method would be to resurface this section of highway. But since only the joints are faulted, the pavement can be saved. "This project lets you get more life out of the pavement before you have to cover it up," Thurston adds.

The diamond grinding equipment is a long, narrow machine. Its frame is made of lead to increase the weight and force of the cutter that carves the grooves in the pavement. The machine travels about 8 to 10 feet per minute while it's cutting. When it's just moving into place, it goes at the breakneck speed of

Transit Workshop Trains Drivers

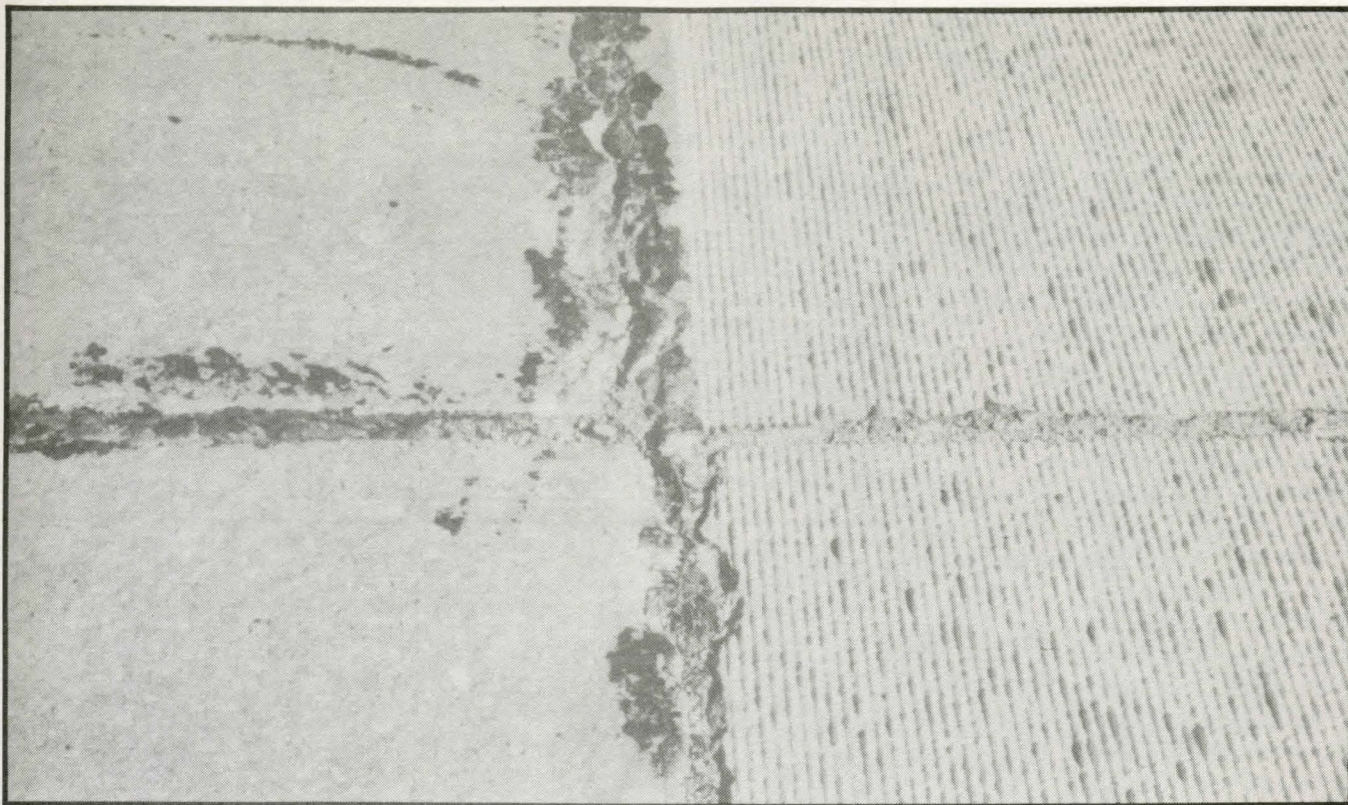
The department's Transit Unit cosponsored a 16-hour training course for 100 St. Louis area transit drivers of the elderly and handicapped April 27 and May 11 at the Viking Hotel and Convention Center in Sunset Hills.

This was the first course to be offered by the department and the East-West Gateway Coordinating Council, St. Louis' metropolitan planning organization that assists in various governmental funding programs. The department provided \$7,500

of the \$10,000 cost of the training program.

"Being a driver for the elderly and handicapped requires special skills and techniques not expected of regular transit bus drivers," Transit Director Phil Richeson explains. "Special transportation providers are usually small and do not have the staff, facilities or financial ability to provide adequate driver training."

This training included defensive driving, communications and behavior management, seizure management, vehicle safety, passenger handling and lifting and first aid. Those who successfully completed the cardiopulmonary resuscitation (CPR) training were also certified during the course.



Diamond grinding gives highway pavement a new texture by taking off the bumps and smoothing the surface. On the left is pavement before the process, and on the right is pavement after diamond grinding.

about 1 mile per hour!

The cutting head is 38 inches long and has 54 diamond-edged saw blades per foot. These saw blades use industrial diamonds that are rough-cut cousins of the diamonds in a wedding ring. Diamonds are used because of their extreme hardness that allows them to easily cut through the pavement. The cutter head alone costs \$80,000.

As the cutting head revolves, the machine uses water to keep the saw blades from getting too hot because of friction. Then the water and the cuttings from the saw blades are sucked off the pavement by the machine's vacuum.

District 7 Construction Engineer Ed Locke was pleased with the machine's performance. "It's done a nice job. The pavement is smooth again," he

says. "It does look like a good method of increasing the life of our pavement. We think it will benefit us down here."

According to Assistant Construction Division Engineer Coy Breuer, some other states use this technique extensively. "California uses it to improve skid resistance," he says. "We've used this method a few times before, but only in small areas as corrective measures on another contract."

And this won't be the "solitary" time the department uses this method on a major project. The Surveys and Plans Division is investigating other problem highway sections, according to Division Engineer Jim Roberts. "We would look at using this anyplace where you have sound concrete and a rough riding surface," he says.

Ingenuity in Action

Way back in the Stone Age, the search for a better mousetrap began. Through the ages, this search has brought us the wheel, the car and now the space shuttle.

But this search isn't over!

It continues here in our department as inspired employees around the state create new equipment and modify old equipment to improve the quality of their work.

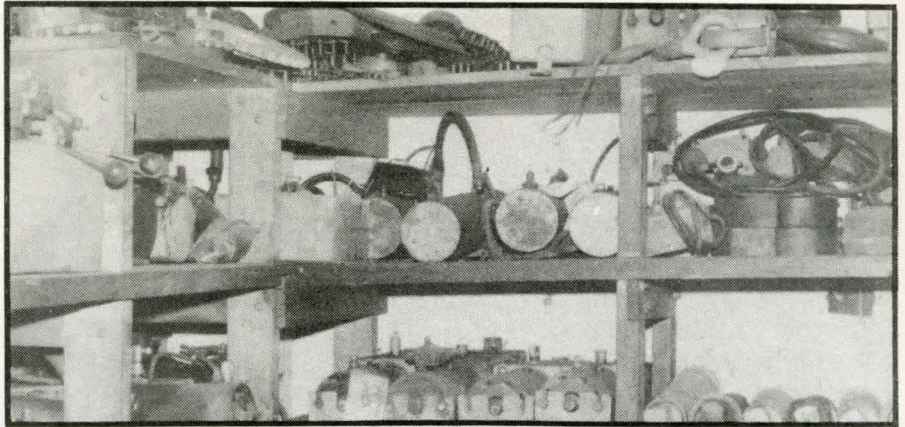
This homemade equipment covers a variety of inventions, from an auger that uses hydraulics to dig postholes to the pole on the front of a truck that takes the inconvenience out of carrying cones.

Phil Broyles, District 8 maintenance and traffic engineer, says, "These might not be earth-shattering discoveries, but the ideas make the job easier and make us more efficient."

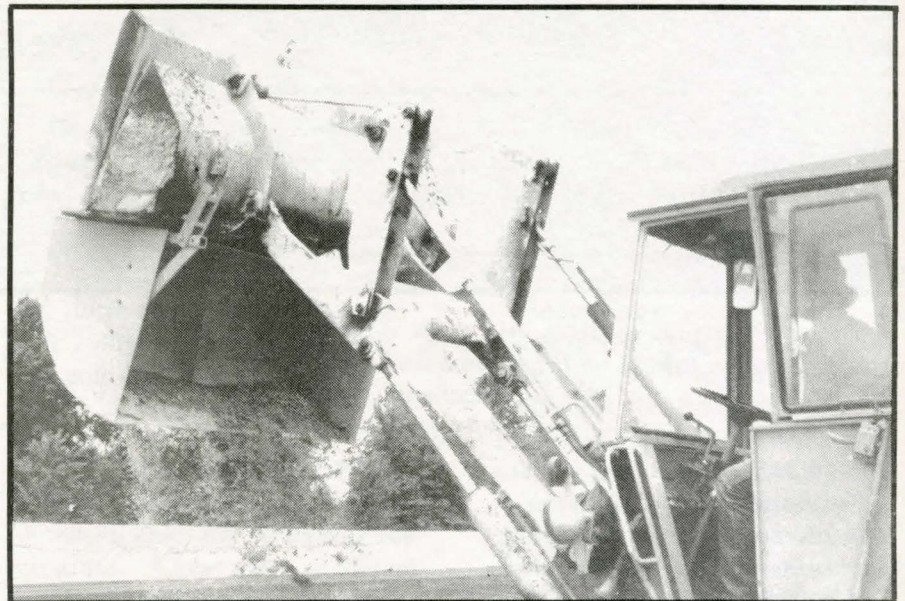
Claude Burks, building specialist in District 8, is one of these idea men. He has come up with several inventions, one of which is the curb grass cutter. This takes the inconvenience out of trimming grass that hangs off the curbs in the cities. The cutter, which hooks on a tractor mower, has a blade like a saw that cuts alongside the curb. Then the cutter's scraper arm comes behind and scrapes the cuttings.

If Burks hadn't invented the cutter, the district would use a motor grader to trim the curbs. "That's like cutting steak with a chain saw," says Burks. "We work on these things in our spare time, but sometimes they can become priority items."

The department inventors like Burks use almost all salvaged parts from old, unused equipment to make their new inventions.



Salvaged parts from old equipment are the bread and butter of the department's inventors.



This bottom scoop turns an ordinary loader into a backhoe. It scoops in rather than out, so the loader can move dirt into the roadway rather than into someone's yard.

Jerry Johnson, maintenance crew member at the District 4 Northmoor building, used a barbeque rotisserie motor to create a movable cutting torch on a track that gives a cleaner, straighter cut than doing the work by hand. He got the idea from a new piece of equipment the department could have bought for \$250. Johnson's invention cost about \$5!

There's a specific route each of these inventions takes through department channels, according

to Roy Coplen, assistant division engineer-maintenance. The district comes up with an idea, and the Main Office reviews it before the district tries it. Then when the results prove worthwhile, the inventor district works up drawings that are distributed to all the districts for use and modification. This process gives it the department patent, so to speak.

"We like them to channel it through here," Coplen says. "That way it's not necessary for all the



Claude Burks, building specialist, is one of the ingenious employees in District 8. He invented an auger that hooks on a backhoe to make it easier to clean out pipes and culverts. The auger can reach 70 feet.

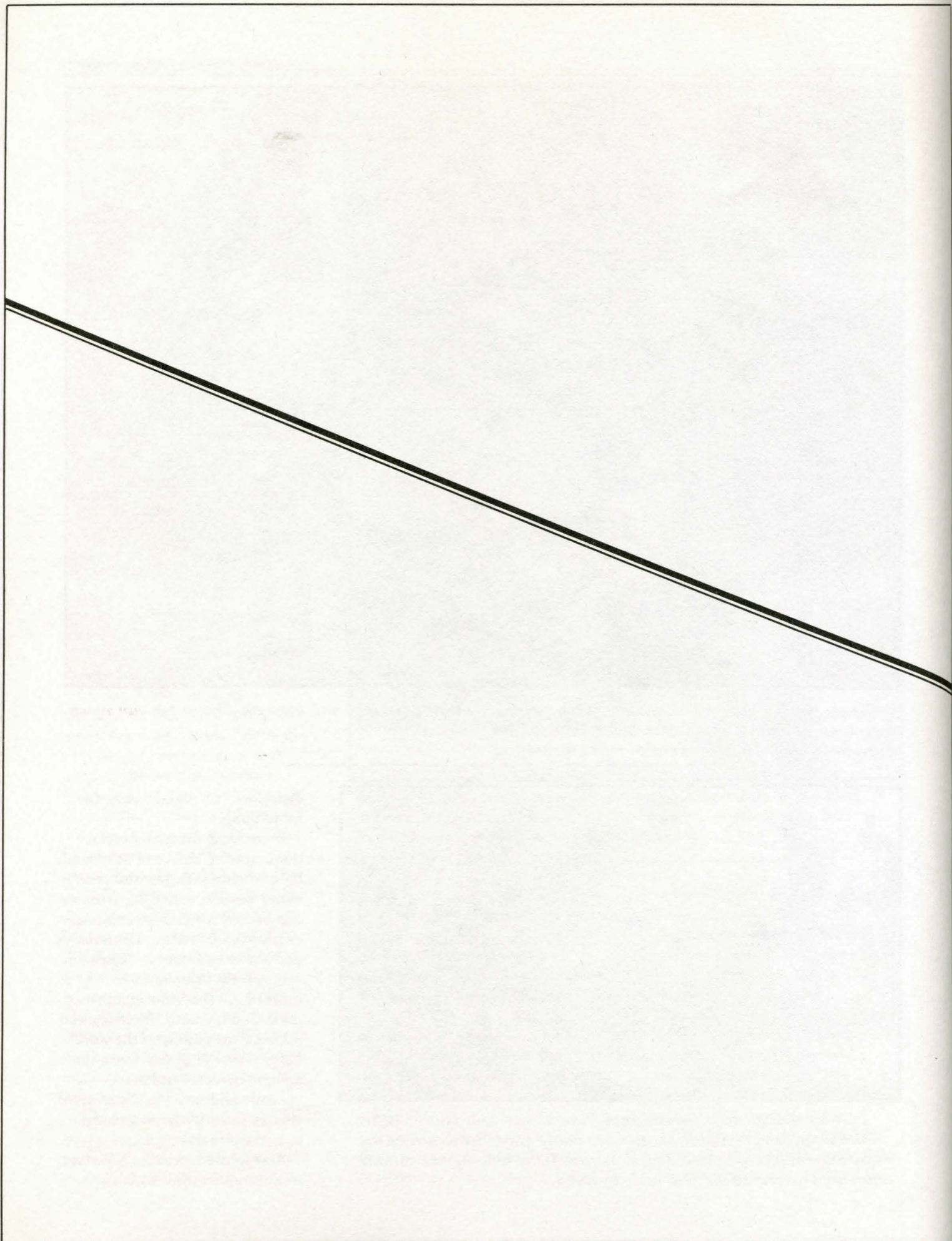


District 4 Highway Maintenance Supervisors Bob Gilkey (left), Northmoor, and Rolland Thomason, Platte City, demonstrate the hydraulic auger posthole digger. It can dig a hole in one minute that used to take 10 minutes to do by hand.

districts to try and develop the same thing."

Depending on each district, there may be one man or several men who do the inventing, but either way the entire department can benefit from these creative employees. Clif Jett, maintenance and traffic engineer in District 5, sums up the value of these inventors. "The innovations they make can increase efficiency and improve the quality of the work being done. They can make the equipment safer and more versatile and save the department money since it's usually cheaper to make it than buy it."

And so the search for a better mousetrap continues . . .





Divisions

**Missouri Highway
and Transportation
Commission**

Accounting

The accounting and expenditure control for the department is the direct responsibility of the Accounting Division. All of the department's records of financial transactions are processed and recorded by this division.

Based on anticipated revenues and disbursements, the division prepares legislative budget requests as well as annual internal budgets. The division reviews all payment documents for accuracy, priority of payment, and to determine if funds are available prior to recording and certification for payment.

The division processed 203,035 checks during 1985. This represents disbursements of \$699,205,038.96. Disbursements by other state departments from highway funds equaled \$99,278,720.37. Total disbursements from all funds for 1985 equaled \$815,680,550.05.

Workers' compensation benefits and medical care payments under workers' compensation are made by the department's insurance carrier. However, these payments are routed through the division and recorded to insure absolute accuracy of fiscal records. There were 699 workers' compensation cases processed this year. The division has the responsibility for administering the regulations and policies of the Highway Employees' and Highway Patrol Medical and Life Insurance Plan, which includes the Optional Life Insurance Plan. As of Dec. 31, 1985, there were 9,781 health insurance plans, 7,868 state furnished life insurance plans and 6,958 optional life insurance plans in force.

For the period from Jan. 1, 1985, through Dec. 31, 1985,

there were 25,359 health claim payments made with \$9,773,326 paid in benefits. During the same period, there were 20 life claims under the state furnished plan and 22 life claims under the optional life plan made with \$164,162 and \$700,374 paid respectively in benefits to survivors.

Bridge

The Bridge Division is responsible for the design of bridge structures on the state highway system.

During the year, 144 designs were completed for letting. Of this number, 119 were designed for major system routes with 25 to be built on supplementary routes.

The total length of all new structures contracted during the year amounted to 34,720 feet at a cost of \$68,351,709. Of these amounts, 3,796 feet were contracted on the supplementary system at a cost of \$5,401,932.

Contracts were let on three major structures during 1985. Renovation of the Route 5 Bridge across the Osage Arm of the Lake of the Ozarks was contracted for at a cost of \$2,698,920. A contract for new construction was also let on the Interstate Route 670 viaduct at the Missouri-Kansas line in Jackson County at a cost of \$7,051,620. Contracts were let on the Route 40 Missouri River Bridge at Gumbo for the fabrication and erection of the superstructure steel at a cost of \$12,179,666.

In addition to the design for new structures, 141 designs were prepared for repairing, widening or extending of 60,850 feet of existing bridges at a cost of \$33,668,349.

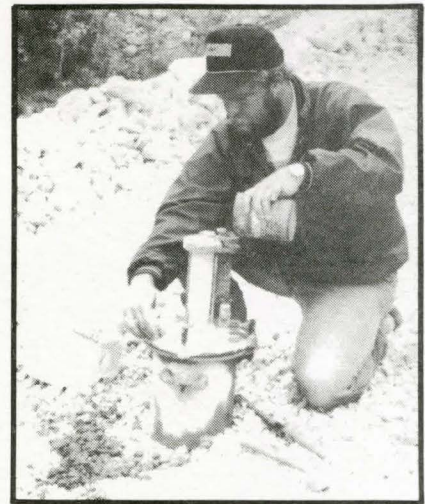
Nine designs were prepared for county bridge replacement under

the Federal Highway Administration Off-System Program.

In addition to structure design, this division has been assisting in the inspection and rating of off-system or county and/or municipally owned bridges as part of the Federal Highway Administration Bridge Replacement and Rehabilitation Program.

Construction

Construction work continues on Interstate Routes 44 and 270 and Route 40 in the St. Louis area, Interstate Route 229 near St. Joseph and Interstate Routes 29, 35, 70, 435 and 670 in the Kansas City area. In addition to this work, construction was active on two new bridges over the Missouri River. Repair work on the



District 5 Inspection Assistant Jim Pasley performs a concrete air test. Inspectors make sure the concrete used during a project has the proper air content. This makes it less susceptible to the cracking that repeated freezing and thawing can cause.

Active Projects as of Dec. 31, 1985

System	Awarded in 1982	Awarded in 1983	Awarded in 1984	Awarded in 1985	Total
FEDERAL-AID FUNDS					
Interstate	0	2	16	58	76
Primary	0	7	29	84	120
Supplemental	0	2	4	32	38
Off-System	<u>0</u>	<u>0</u>	<u>1</u>	<u>6</u>	<u>7</u>
Subtotal	0	11	50	180	241
100 PERCENT STATE FUNDS					
Interstate	0	0	0	0	0
Primary	0	1	22	41	64
Supplemental	<u>0</u>	<u>0</u>	<u>3</u>	<u>10</u>	<u>13</u>
Subtotal	0	1	25	51	77
TOTAL PROJECT	<u>0</u>	<u>12</u>	<u>75</u>	<u>231</u>	<u>318</u>

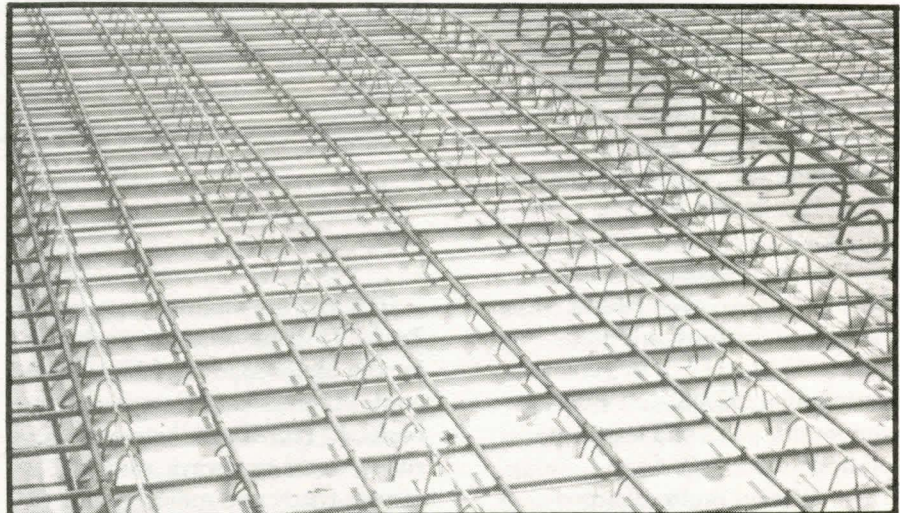
Interstate Route 70 Bridge over the Missouri River at St. Charles was completed this year. The Liberty Bend Bridge, a major structure on Route 291 over the Missouri River in the Kansas City area, was started this year.

Interstate system contracts involved new construction, upgrading existing dual facilities to Interstate standards, rest area modifications and implementing the latest safety features for highway traffic. About four miles were completed to Interstate standards this year. This division resurfaced 92 miles of existing Interstate pavement with asphaltic concrete this year. Approximately 20 miles of Interstate road are now under construction.

Primary and supplementary system contracts included new construction, bridge replacements and widening and resurfacing projects. Where applicable, the latest safety features were included. The

contracts included costs of construction work in rural and urban areas and projects financed either with federal-aid or with 100 percent state funds.

Costs of inspecting construction projects were kept at a low level by upgrading equipment along with additional personnel training.



Steel rebar or reinforcing rods are placed to support the concrete that will make up this bridge deck.

Equipment and Procurement

The Equipment and Procurement Division is responsible for procuring and maintaining a fleet of equipment that will efficiently and effectively permit the department to carry out its functions. At the end of the year, the division was maintaining 5,955 rental units consisting of passenger cars, trucks, carryalls, tractors, mowers, motorgraders and various miscellaneous units.

Fuel used in the fleet during 1985 increased 13.4 percent from 1984. The average price of gasoline dropped 1 percent, while the average price of diesel fuel dropped 4.9 percent. The fuel monitoring program that became operational in 1984 is still being perfected. Fuel consumption problems on individual equipment units are being reviewed by various levels of supervision.

Department operations required 7,824,054 gallons of gasoline; 142,647 gallons of kerosene; and 1,928,383 gallons of diesel fuel to operate the fleet. In addition, 10,725 gallons of anti-freeze; 98,847 gallons of lubricating oil; 58,046 gallons of hydraulic oil; and 102,141 pounds of multi-purpose gear oil and lithium grease were used. During the year, the division contracted for tires and tubes costing \$538,871.55; tire chains costing \$64,292.08; and shop equipment, parts and supplies totaling \$6,285,529.54.

The division is also charged with the responsibility of providing all tools, supplies and materials that are required in department operations.

The Headquarters Sign Shop produced a total of 98,093 signs and markers of various shapes

1985 Maintenance Materials Used

MATERIAL	AMOUNT USED
Various Types of Asphalt	45,240,500 gallons
Gravel	680,104 cubic yards
Stone and Chat	1,365,693 tons
Paint	572,442 gallons
Reflectorizing Spheres	3,767,100 pounds
Sodium Chloride (Winter 1984-85)	140,555 tons
Calcium Chloride (Winter 1984-85)	6,903 tons
Agricultural Seed	41,320 pounds
Treated Wood Sign Posts	17,624 each
Steel Sign Posts	26,250 each
Grader Blades	651,375 pounds

and sizes amounting to \$992,613.22 during the year.

Use of a die cutting machine, purchased in 1983, to cut letters out of scrap reflective sheeting continues to save the department approximately \$10,000 per year.

This year was the first full year that storage batteries—complete with electrolyte, fully charged and ready to use—were purchased and shipped direct to each district office. The estimated savings will be \$10,300 per year.

During the spring of 1985, the

division implemented direct shipment of tires and tubes from the supplier to each district office. While there was an overall increase in bid prices from the previous year, this cost was more than offset in elimination of double handling of the tires and tubes. Savings in freight costs for 1985 are estimated at \$21,000.

As a cost-cutting measure, other types of supplies and equipment are produced at the Headquarters Garage as time and labor are available.

Maintenance and Traffic

In 1985, the Maintenance and Traffic Division was responsible for the maintenance of 33,396 center-line miles. This mileage included recreational access roads, outer roadways, ramps, service roads and maintenance agreement sections.

One of the major expenditures of the Maintenance and Traffic Division is on low-type bituminous surface routes. In an effort to reduce maintenance expenditures for the past several

years, the division has been reducing the maintenance surface treatment program. For 1985, 24,515 miles of maintenance leveling course were budgeted. In addition, the division completed 905 miles of contract leveling course.

One of the major objectives for cost and energy control continues to be reduction of the use of cutback asphalt. In 1985, the division used 10,187,900 gallons of cutback asphalt and 35,052,600 gallons of emulsified asphalt, 77 percent of the total used. About 45,240,500 gallons of asphalt and 1,442,840 cubic yards

Legal

During 1985, the chief counsel's office instituted various court actions condemning right-of-way for state highway projects. These actions involved the acquisition of 136 separate tracts of land. One hundred fifteen condemnation cases were disposed of by the entry of final judgments during the year.

The appellate courts of Missouri rendered decisions in 61 separate cases to which the commission was a party.

The chief counsel's office handled 2,376 claims for damage to commission-controlled facilities and property and received payments for such damages in the amount of \$682,470.06. This included damages collected by litigation as well as those collected without the necessity for instituting litigation, and includes damage to one Highway Patrol vehicle. Thirty-one cases were filed during the year for damage to commission-controlled property, and 40 cases of the same nature were disposed of.

During the year, 49 cases were filed against the commission for various matters, 32 of which involved tort actions. Forty-five cases involving various matters other than condemnation and suits for damage to commission property were disposed of during 1985. Although there were 13 applications filed with the Transportation Department for the Office of Economic Development to permit the construction or alteration of railway-highway crossings, no formal hearings were necessary because of the agreed nature of the proceedings.

Eleven new cases were filed for enforcement of the Beautification Law pertaining to junkyards, and 39 cases were closed, leaving 15 cases still pending in court at the end of the year. Also, during the year, there were 34 petitions filed in court in reference to the Beautification Law by which owners of billboards sought review of commission orders relating to the removal of outdoor advertising signs. In addition to the court proceedings, administrative hearings were conducted on behalf of the

commission relating to outdoor advertising signs in 38 separate cases involving 52 individual signs.

The chief counsel's office also conducted administrative

The appellate courts of Missouri rendered decisions in 61 separate cases to which the commission was a party.

hearings relating to other matters. Two such hearings involved payments for relocation assistance for persons who had been displaced from their property because of its acquisition for highway improvements, and six such cases involved hearings relating to the necessity for altering utility facilities to permit highway construction.

In addition to the litigation handled by the chief counsel's office, various other routine matters were handled. These included the examination of title information in the acquisition of property for right-of-way and the preparation and review of various contracts to which the commission is a party.

of aggregate were used on bituminous surface and patching operations.

The department, in a continuing effort to conserve

The division was responsible for the maintenance of 33,396 center-line miles.

energy, has been building pool parking areas in and adjacent to metropolitan areas. This program was started in 1975 with the original construction of 717

spaces. Since 1975, the division has added 3,829 parking spaces through the construction of new areas and the expansion of existing areas. On Dec. 31, 1985, the division had 4,546 spaces available for pool parking.

The average daily usage of the parking areas in the last quarter of 1985 was 2,514 vehicles compared to 2,371 in the last quarter of 1984. In 1975 when the program began, average usage of the available spaces was 42 percent. This had increased to 55 percent in the last quarter of 1985.

The division mowed

approximately 391,075 acres of right-of-way at a cost of \$9,956,676 in 1985. The average cost per acre was \$27.23. In addition to this expenditure, \$1,608,001 was spent picking up litter.

Division personnel made routine inspections on all state maintained bridges to determine their condition and need of repairs. In 1985, 6,578 bridges on the state highway system were inspected. Thirty-seven of these are Missouri or Mississippi River crossings, 19 of which are jointly

(continued)

maintained by adjacent states.

Division repair crews completed structural repairs on 97 bridges. In addition, 11 other structures were repaired because of collision damage.

One hundred nine bridges were painted by division bridge crews during the year. Ninety bridges received a complete painting, while 19 were partially painted. The crews applied 5,579 gallons of paint.

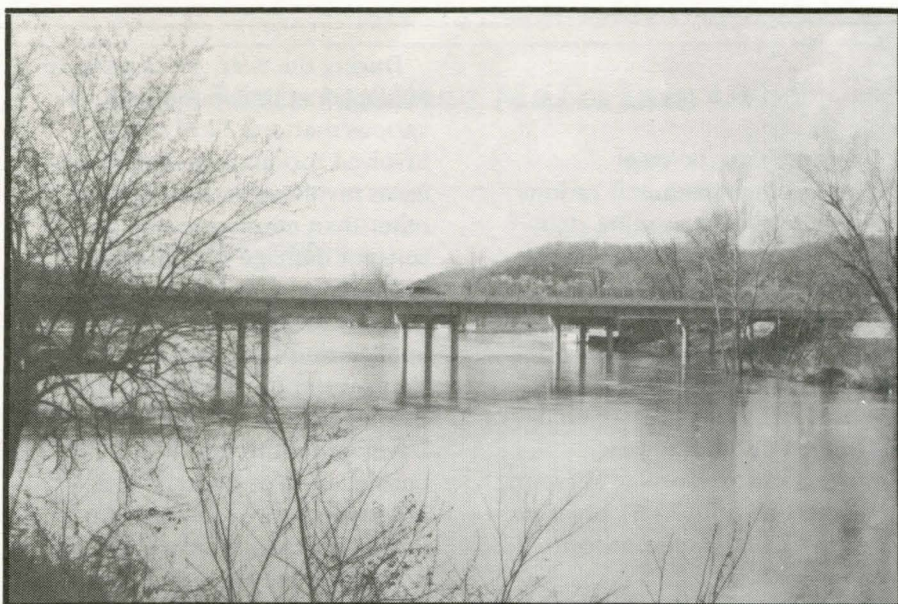
The division is maintaining 20 rest areas on the Interstate system. Four include tourist information centers. In addition, there is also a tourist information center located in Hannibal on Route 61.

Efforts to control Johnsongrass continue, especially in counties that have adopted the Johnsongrass Law. In 1985, about 4,100 acres were sprayed by contract and about 2,600 acres were sprayed by maintenance forces in an effort to control Johnsongrass. In addition to the Johnsongrass Control Program, approximately 14,000 acres were chemically treated to control thistle and other weeds and brush.

The division purchased approximately 49,800 pounds of seed for use in overseeding and spot seeding disturbed areas of right-of-way at a cost of about \$34,400. Included were 5,500 pounds of crown vetch, which is used for planting unmowable slopes.

There were 83,508 overdimension, overweight and overdimension/overweight special permits issued during 1985. Of this total, 21,284 or 25 percent were issued by the district offices. Included in the total were 536 permits issued to governmental agencies or subdivisions with fees.

The winter of 1984-85 was more severe than the winter of 1983-84. As a result, chemical use increased. The division purchased 140,555 tons of sodium chloride



In 1985, division personnel inspected 6,578 bridges on the state highway system, like this one on Route 59 crossing the Elk River at Noel.

and 6,903 tons of calcium chloride. A total of \$22,481,134 was spent on snow removal in the 1984-85 winter season, an increase of 3.3 percent from the previous season.

During 1985, six intersections on state highways were signalized by permit, two by counties and two by maintenance forces. Modernization of existing traffic signals continued throughout the state.

Maintenance forces upgraded or installed new traffic control equipment at 26 existing signalized intersections. The program to interconnect various traffic signals for traffic progression was continued. New product equipment to control traffic signals more economically were placed in service for evaluation.

Contracts were let to replace a number of two-way mobile radios and fixed station equipment and remote control consoles in two of the districts.

The ongoing program of systematic monitoring of peak period freeway traffic operations

in the St. Louis and Kansas City areas was continued in 1985. This surveillance program provides information on the location and severity of traffic congestion on this combined urban freeway system of about 170 miles.

Additional surveillance and analysis were made at specific problem locations. These included Interstate 70 in St. Charles and St. Louis counties from Cave Springs to Interstate 270 and Interstate 70 in Kansas City from Prospect to Interstate 435. Other spot locations were the subject of more limited studies.

During the construction season, much of the freeway system was impacted by the construction activity.

In 1985, 70,962 accidents that occurred on the state highway system were coded and placed in the accident data records system. These reports were provided by the Highway Patrol and approximately 565 city and county enforcement agencies.

Speed studies were conducted at 157 locations and traffic

volume counts were made at 265 locations.

The division continued its 120/Medium Improvement Program in 1985. Twenty-one locations where a higher than normal number of accidents had been occurring were investigated. At 12 of these locations, corrective measures have been implemented.

The division also investigated 100 locations that had 20 or more accidents in the three-year period, and countermeasures were evaluated for possible funding under Section 209 of the 1973 Federal Highway Act. Twenty-five of these locations have been tentatively programmed for improvements on the Right-of-Way and Construction Program at a total estimated cost of \$2,972,132.

State forces removed 22 billboards and property owners

In 1985, 70,692 accidents that occurred on the state highway system were coded and placed in the accident data records system.

removed 373 billboards under the Outdoor Advertising Laws and Regulations.

Activities funded from 402 Program funds under the 3+ Standards of the Missouri Highway Safety Program and coordinated by the Missouri Highway and Transportation Department are as follows:

—The Traffic Engineering Assistance Program: This is a program to aid the political subdivisions with traffic engineering problems where comprehensive review is required and where the subdivision does not have the personnel available to carry out the review. These services are performed by two consultants retained by the

Commission for this purpose.

Thirty-four studies were conducted in 28 political subdivisions in 1985. The average cost of these studies was \$2,514 per study.

—The Bridge Engineering Assistance Program: This is a program established to aid political subdivisions with obtaining information on the structural adequacy of bridges under their jurisdiction. These services are performed by two consultants retained by the Commission on a yearly contract. The service includes determination of structural adequacy, establishment of posted weight limits and development of priorities for the repair or replacement of bridges. Structural adequacy reports and inventories were conducted on 71 bridges during the year at an average cost of \$833 per bridge.

—The 36th Annual Traffic Conference was held on May 13-15, 1985, at the Stephens College Campus in Columbia. Five different activities were conducted under the engineering training portion of our annual program. Eighty-eight participants from various counties, cities and state and federal governments attended this two-day conference that dealt with solutions to traffic problems.

—A series of Introductory Microcomputer Workshops were held. They were conducted in Macon, Joplin, Cape Girardeau and St. Joseph during September. The workshops were developed to acquaint traffic engineers with microcomputers. In addition to hands-on experience, some instruction was given regarding available programs and applications. Seventy-six participants attended the various workshops.

—Advance Microcomputer Workshops were also held this year in the cities of



Maintenance Crew Member Patty Crocker operates the jackhammer on Route 50 near Jefferson City.

Independence, Springfield and Kirkwood during July. The workshops were developed to give traffic engineers hands-on experience and training with advanced software programs used in traffic engineering. Fifty-one participants attended the various workshops.

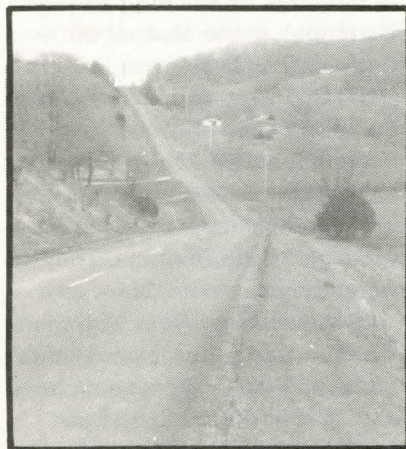
—Seminars on the Supplemental Handbook to the Manual on Uniform Traffic Control Devices (MUTCD) were conducted during the months of July and September. The seminars were held in the cities of Independence, Springfield, Kirkwood and Columbia. They were designed to acquaint city and county employees with the handbook and how it would affect traffic engineering practices in cities and counties. Sixty-four participants attended the various seminars.

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—An Accident Reconstruction and Analysis Seminar was held in Jefferson City on June 25, 1985. The seminar was designed to acquaint city, county and state employees with the procedures involved with Accident Reconstruction and Analysis. Thirty-five participants attended the seminar.

The sign reclamation plant, which began operation in September 1977, provided 66,211 metal and 284 wood signs or 67 percent of the sign blanks used in 1985. In addition to providing sign blanks, other component parts of sign hardware such as z-bars, button copy, button reflectors, locking tabs and backing strips were also salvaged by the reclamation plant. The total savings to the department by the reclamation plant during 1985 was approximately \$273,448.63.

During the year, the department placed 58,800 miles of center-line, lane-line and edge-line stripes. This total included 36,400 miles of center-line and lane-line stripes and 22,400 miles of edge-line stripes. In conjunction with this striping, approximately 16,500 miles of no-passing zone stripes were also placed.



Route 90 in McDonald County

Materials and Research

The quality of materials intended for use in the construction and maintenance of the state highway system is the primary responsibility of the Materials and Research Division. This responsibility is carried out by overseeing and coordinating field inspection by personnel assigned to the ten districts including the sampling, testing and approval of various materials prior to use.

Research to improve materials performance, refine procedures or reduce costs is another important function of the

division. Designs for all bituminous and portland cement concrete mixtures, as well as all needed subsurface exploration are also performed by the division.

The central laboratory for the testing of materials is maintained in Jefferson City. This laboratory is an approved facility that is inspected regularly by national inspection agencies such as the Cement and Concrete Reference Laboratory and the American Association of State Highway and Transportation Officials Materials Reference Laboratory. Very good scores are consistently received. Many of the materials that are routinely tested in the field are also tested in the laboratory. This

1985 Commonly Used Materials Inspected, Tested and Approved

MATERIAL	AMOUNT	
Aggregates	11,745,399	tons
Cement	533,398	tons
Reinforcing Steel	30,624	tons
Culvert Pipe		
Corrugated Metal	201,692	linear feet
Reinforced Concrete	149,194	linear feet
Vitrified Clay	1,208	linear feet
Joints - Bituminous, Fiber	272,358	linear feet
Joints - Rubber	26,069	square feet
Joints - Metal	175,600	linear feet
Guardrail	181,878	linear feet
Posts, Metal	77,982	posts
Precast Units		
Median Barriers	15,474	units
Concrete Bridge Beams	1,581	units
Concrete Inlets	1,141	units
Concrete Manholes	178	units
Lumber and Square Posts	249,965	board feet
Piling and Round Posts	8,535	linear feet
Bituminous Material		
Cutback	10,271,814	gallons
Penetration	6,826,295	gallons
Emulsified	36,697,839	gallons
Asphalt Cement	35,952,343	gallons
Paint	413,564	gallons

is done in order to insure uniformity of testing procedures on a statewide basis. The laboratory also tests all materials requiring specialized procedures.

In 1985, a total of 17,068 samples were tested in the laboratory including those of an experimental or investigative nature.

During 1985, the division was actively engaged in 14 major research projects. In most cases, both laboratory and field investigations were required. Items of investigation ranged from materials and methods used to stabilize landslides on highway embankments to methods for increasing concrete durability. Among the other investigations performed were the evaluation of approximately 106 new products proposed for use, as well as a

large number of various small investigations such as pavement condition and erosion control methods.

With the increased emphasis on bridge rehabilitation, the division has been given responsibility for a large number of bridge deck condition surveys. These surveys are required to determine the amount of rehabilitation necessary such as patching, waterproofing and, in some cases, the addition of new wearing surfaces. In 1985, 235 bridge deck condition surveys were performed. Each survey consisting, at a minimum, of electrical testing to determine if the reinforcing steel is actively rusting; of sampling the concrete at various depths to determine the amount of salt contamination; and of comprehensive mapping of

both the top and bottom of the bridge deck to indicate the location of all cracks, patches, unsound areas and staining.

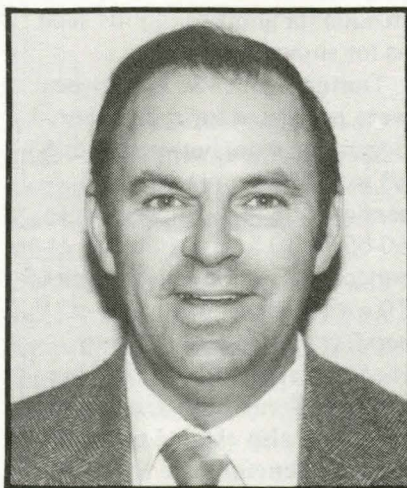
The division has the responsibility for obtaining and interpreting the subsurface information required to effectively design highways and bridges. The basic data is obtained by drilling equipment and crews based in the division headquarters in Jefferson City. Crews and equipment are dispatched as needed to all parts of the state. Division personnel are available to conduct special investigations, analyze materials and make recommendations on the various geotechnical matters such as foundation stability and settlement, slide corrections, soil and material surveys and retaining structures.

Personnel

The Personnel Division provides staff assistance to the department regarding personnel management matters such as employment, college recruiting, employee training and development, wage and salary administration, personnel policy administration, affirmative action administration, employee relations and maintenance of personnel management records and statistics.

The division assists in developing and implementing administrative programs to ensure that competent applicants are attracted to jobs with the department, that employees are properly trained in their occupation and that working conditions are conducive to both high productivity and fairness toward employees.

The department is an equal



*District 5 Maintenance Area
Supervisor Jim Wunderlich*

opportunity employer and considers affirmative action a high priority. The Personnel Division, along with the districts, has concentrated efforts to attract qualified minority and female applicants. The division monitors Equal Employment Opportunity (EEO) progress and keeps the

Headquarters Office and districts informed.

The orientation and training of new employees is primarily conducted through the department's supervisors. New employees are provided with several publications to familiarize them with the department's functions, working rules and regulations and employee benefits.

Employees, in obtaining the fundamental knowledge of their job, may become eligible for attendance at training conferences and seminars related to their specific work assignments. Most technical skills training is provided by operational divisions, using staff with the necessary expertise. The division supplements this employee training by periodically conducting supervisory training programs tailored specifically to

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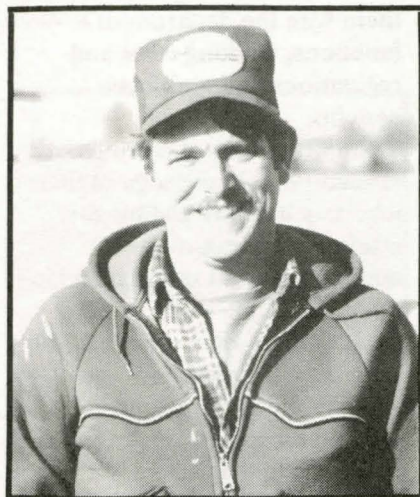
the policies and needs of the department.

The department continues to develop its human resources, minimize costly employee turnover and maintain a work environment conducive to high employee morale and motivation. All personnel transactions are reviewed by the division to attain equitable and uniform salary administration and policy application. Job evaluations are conducted to maintain accurate job specifications and internal salary equity.

To maintain an adequate salary structure and employee-benefits program within budgetary limitations, periodic compensation surveys are conducted. During the year, a review of records for prior state service that may be creditable toward retirement continued.

The division maintains daily liaison with headquarters and district administrative personnel to assist in clarifying personnel administration matters.

The division processed 109 claims for unemployment compensation during 1985 and obtained 80 denials of unwarranted compensation,



District 5 Highway Maintenance Supervisor Wayne Simcoe

thereby avoiding considerable expense to the department.

Centralized personnel records are kept with considerable personnel data being used for statistical analysis of employee profiles, employee trends, manpower planning, etc. Personnel records have been improved through computer applications, which permit a more rapid recovery of personnel data required for government and operating reports.

The Department had 6,195 salaried employees on Dec. 31, 1985, in addition to 521 summer

The department is an equal opportunity employer and considers affirmative action a high priority.

employees during the summer of 1985. Temporary and emergency employees are also employed as needed for short durations such as for snow removal.

During 1985, 150 employees were processed for retirement. Seventeen were between ages 55-60 with 15 or more years of service; 101 were between ages 60-65 with 15 or more years of service; 18 were between ages 65-70 with four or more years of service; and 14 had become incapacitated and qualified for disability benefits. Eight vested members also elected to begin annuity benefits. The Highway Employees' and Highway Patrol Retirement System is currently paying benefits to 2,200 department retirees and survivors.

The department recognizes that skilled work results, high productivity and sound decision-making are products of retaining a trained, experienced work force. As of Dec. 31, 1985, the average employee had given 14 years and 7 months of service to the department.

Planning

The Planning Division is responsible for the collection and maintenance of financial and roadway information used in determining needs, planning for highway improvements and developing financial programs.

In-depth studies were made of the functional classifications for the entire state highway system. Preliminary reports were prepared and distributed to district and division personnel for their review.

Comprehensive planning for the six urbanized areas of more than 50,000 population is a continuing process requiring the cooperative efforts of the local planning organizations and the department. This planning process continued through 1985 in the urbanized areas of St. Louis, Kansas City, Springfield, St. Joseph, Joplin and Columbia.

Assistance was provided to all cities of more than 5,000 population for updating functional classification and federal-aid systems. Nearly one-half of the data compiled for the National Highway Performance Monitoring System was developed from the characteristics of the six urbanized areas.

The division conducted origin-destination studies at five locations within the state to determine travel characteristics. The information gathered from these studies was used in determining needs, designing improvements and programming projects.

Truck classification information was gathered at all truck weight stations in 1985. About 4,000 vehicle machine counts and 150 manual vehicle-classification studies were made throughout the state. Vehicle speeds were monitored at 34 locations on the

Status of Missouri Highway System

(As of Dec. 31, 1985)

SYSTEM	ROAD MILES
Interstate	1,152.623
Primary	6,831.279
Supplementary	24,276.027
TOTAL	32,252.143

TYPE	ROAD MILES
Granular	1.184
Low-Type Bituminous	24,862.410
High-Type Bituminous	4,664.222
Concrete	2,732.113
TOTAL	32,259.929

state system to determine average speeds by roadway type. Vehicle miles of travel on the state highway system increased about 2 percent from 1984.

The annual vehicle travel and accident report was prepared for 1984. The report includes information on travel, accidents and accident rates for all roads and streets within Missouri.

The 1985 Bridge Service Rating was prepared showing the physical characteristics and condition ratings of all bridges on the state system. Information to update the Interstate, primary, secondary and bridge service ratings was also gathered. Data used in the annual update of the National Highway Performance Monitoring System was collected, and a report was prepared summarizing the information.

An inventory of low water

crossings and other sections of highways subject to flooding was conducted in 1985. The inventory data included the number and duration of closures, required detour length, vehicle usage and other information indicating the severity of the road being closed due to high water. A report was prepared ranking the roadway sections based on a severity index rating.

The division prepared the 1986 Highway Right-of-Way and Construction Program that shows the award of contracts, additions to the program and revisions. Work also began on development of the 1987 Highway Right-of-Way and Construction Program.

During this past year, 24 county highway maps were either revised or redrawn. There were also 13 urban-vicinity maps and 420 city maps updated.

Public Information

The Public Information Division is responsible for keeping employees and the general public informed about the many activities of the department.

One of the employee communication tools the division uses is **The Highway and Transportation NEWS**. This year the NEWS received a change of face with a new format, new typestyles and new printing paper. The division revitalized the paper to keep pace with the department as it continues to grow and change. This publication was published and distributed monthly to more than 9,000 people.

Two slide presentations were produced during the year. An orientation show titled "The Family" was developed for new employees. This program welcomes them and provides general information about the department and its districts and divisions. The ten districts received either a slide or video version of the show to be used in conjunction with other individual district orientation activities.

Another slide presentation titled "Missouri Bridges" was produced. This show details the department's bridges through their beauty and their problems. It was used for presentations to the general public.

During the year, the division prepared and distributed 102 news releases to the media in an effort to keep the public informed about department activities. The statewide newspaper clipping service continued, keeping officials informed of department coverage and comment.

(continued)

The division answered about 200 mail and telephone requests per month regarding maps, road information, routings and educational material.

A variety of speeches and brochures, along with the department's annual report, were developed by division personnel to help tell the department story.

Personnel supervised the distribution of one million highway maps, many of which were distributed at the Missouri State Fair. Personnel staffed the annual fair exhibit in the Highway Gardens, a roadside park on the fairgrounds. This year's exhibit featured a snowblower that was retired during 1985 after 49 years of service to the department. The giant machine fascinated visitors, young and old. More than 300,000 people came through the park during the fair's 10-day run in August.

Keeping track of legislation of department interest kept staffers busy during the months when the General Assembly was in session.

Division personnel assisted in several dedication and opening ceremonies for various projects during the summer and early fall months.

In October, the division coordinated the department's service awards banquet, which recognizes employees with 25 to 45 years of service.

The division also coordinated the Employee of the Month program. One Department employee was chosen each month based on his or her job performance, general attitude, community involvement and distinguished service to the department and to the motoring public.

The department's technical library also continued to be housed in the division.

Right-of-Way

During 1985, the cost of right-of-way acquired for highway construction totaled \$19,731,775.

The division acquired 661 parcels—567 by negotiated settlement and 94 by condemnation, or 86 percent by negotiation and 14 percent by condemnation.

Payments totaling \$235,231.49 were made in 1985 under the Relocation Assistance and Payment Program to assist displaced families, businesses and farm operations in relocating. During the year, 114 relocation claims were processed and paid.

The division obtained appraisals for 830 parcels during 1985. Two separate appraisals were prepared for 5 percent of the parcels involved, making a total of 872 appraisals produced. An average of 74 parcels was appraised each month, which required an average production of 78 separate appraisals per month.

Receipts from the sale of improvements located on right-of-way acquired for highway construction and from the sale of excess property totaled \$297,346.

Rental of airspace, excess property and property acquired for future construction resulted in an income of \$266,259.40 and \$1,000 was derived from miscellaneous sources.



Public Information Director Art Taylor presides at the department's annual service awards banquet that recognizes employees with 25 to 45 years of service.

Surveys and Plans

The Surveys and Plans Division is responsible for preparation of roadway improvement studies, plan preparation and the letting of contracts.

Meetings and formal hearings are held as needed or required to explain the need and purpose of highway improvements and to obtain public input. Coordination is also required with local, state and federal agencies. During the past year, tentative location approval was obtained on 81 highway improvements with 30 formal location and design public hearings and several public meetings held.

Photogrammetric surveys using aerial photography are initiated during early project development. Field surveys supplement this work and provide the basic information for plan development.

Assessment of environmental impacts for each project are considered. This includes air quality evaluation, noise studies and cultural, social and economic considerations. Cultural resource

survey reports were completed on 119 projects.

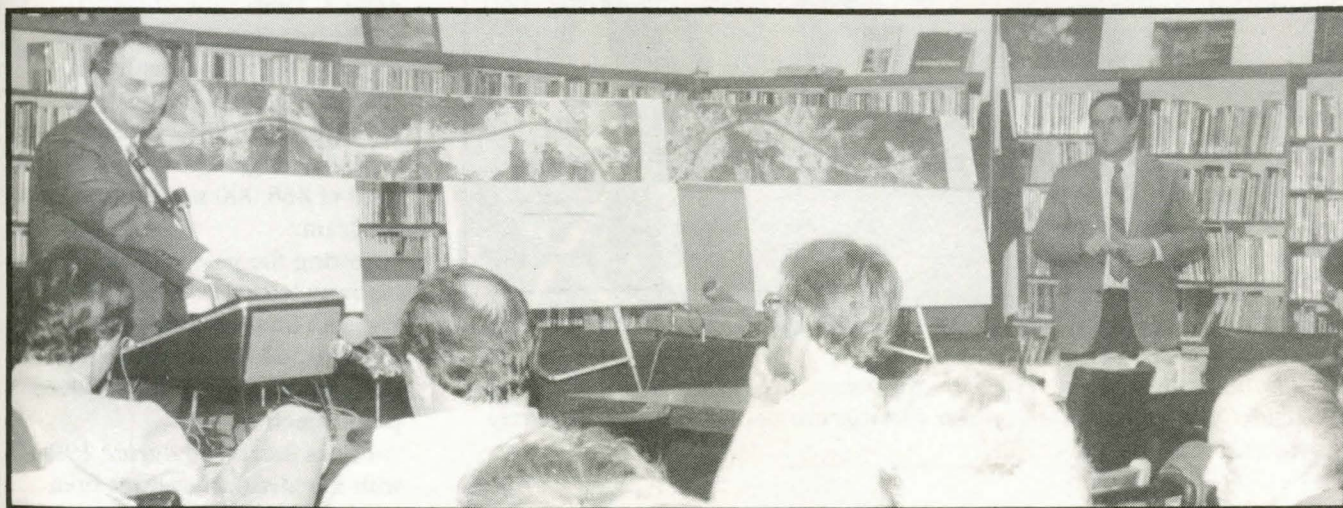
Prior to letting highway improvements, right-of-way is acquired, arrangements are made for necessary utility adjustments and necessary permits and

licenses are obtained from state and federal agencies. Approval of detail plans for right-of-way acquisition was obtained on 107 projects in 1985.

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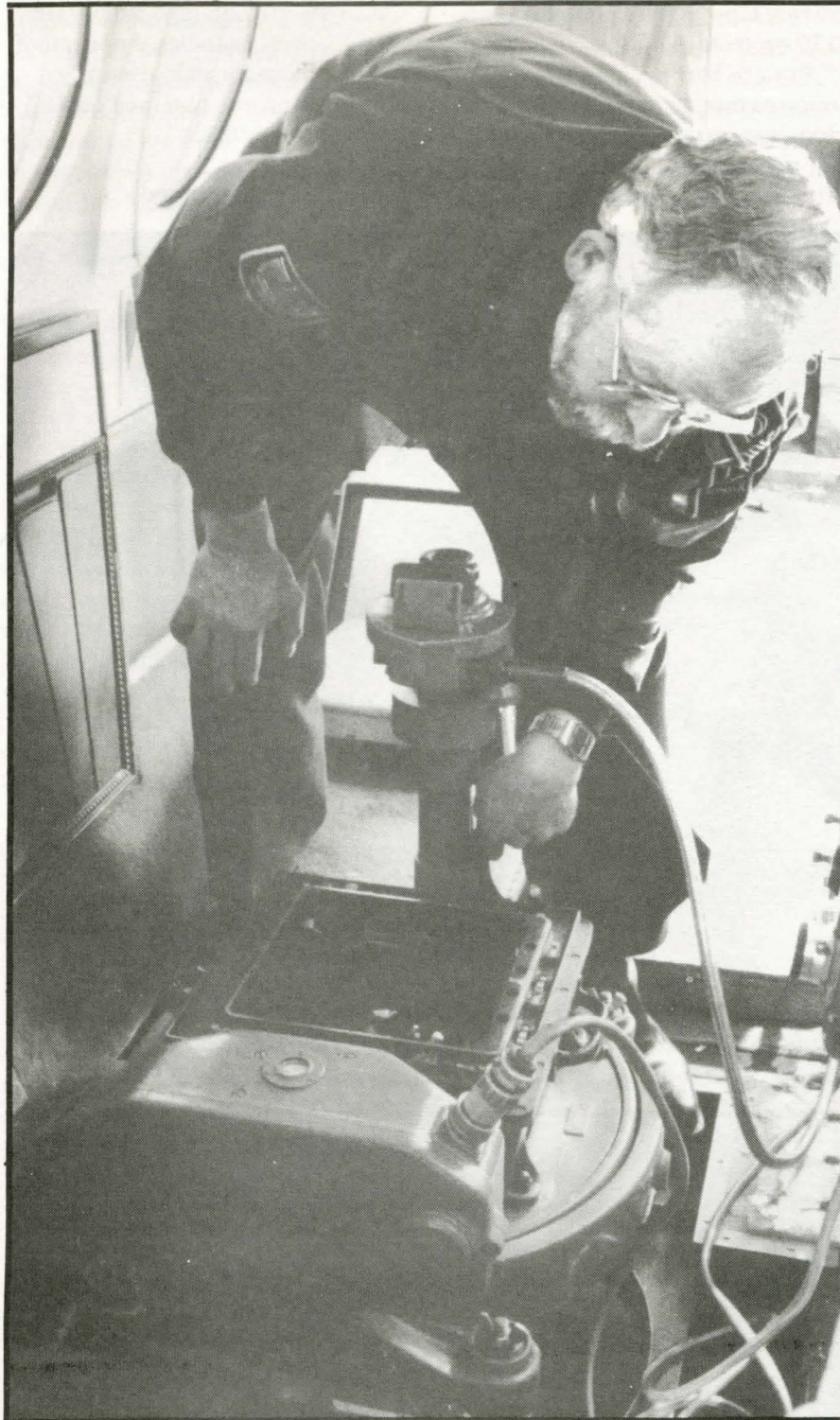


Hearings are held by Surveys and Plans staff members throughout the year to get public opinion on planned improvements.



District 5 Engineer Wayne Muri explains planned improvements on Route 54 to a group of interested

citizens at the Lake of the Ozarks.



Photographer Fred Taggart prepares the department's aerial camera that is used to make photogrammetric surveys in early project development.

The Off-System Bridge Rehabilitation and Replacement Program provides federal funds for bridge repair and replacement on county roads not on a federal-aid system. During 1985, approximately \$9,962,000 was obligated for projects qualifying for this program with counties providing 20 percent matching funds. During 1985, 125 projects were approved for preliminary engineering charges, 41 were approved for construction and 45 projects were placed under contract by the counties.

Safety improvements at railroad-highway crossings are available through the Rail-Highway Safety Program Section 203 Funds. During 1985, 74 crossings were improved by the installation or replacement of standard or cantilevered signals and/or gates. Ten of these crossings were on the state highway system, and the remaining 64 were on city streets or county road crossings. The cost of the work was \$5,180,000, of which 86 percent was spent on the 64 off-system crossings.

Approximately 438 off-system crossings were provided with 12-inch roundels. The remaining 70 crossings will be completed by April 1, 1986.

The ongoing program to improve the riding quality of railroad-highway crossings continued in 1985. Three high-type crossings were completed. A total of \$68,000 was spent on this program.

During the past year, 11 highway lettings were held. Projects totaling \$419,739,810.56 were placed under contract. An average of 3.8 bids was received per project.

Prices increased during 1985 with the Missouri average composite cost index being 188.0 compared to base year 1977. The 1985 cost index reflects a 7.4

Projects Awarded for 1985

1985 REPORT	AWARDS	MILES	PROJECTS
Interstate System	\$ 148,047,303.54	205.415	73
Primary System	181,177,034.51	293.910	121
Supplementary System	63,169,739.08	134.548	93
Maintenance Work	21,832,354.64	1,168.327	178
Off-System (County Bridges)	1,707,354.68	1.457	9
Federal-Aid Urban (on State System)	3,806,024.11	12.794	28
TOTALS	\$ 419,739,810.56	1,816.451	502

percent increase when compared with the 1984 cost index of 175.0.

Projects with Interstate discretionary and bridge discretionary funds totaling \$15,046,306 were realized in 1985. Discretionary bridge funds are made available for larger bridges. Interstate discretionary funds are an extraordinary allotment of Interstate funds that are provided as a bonus to states who have obligated their normal Interstate apportionment and are in a position to use these funds within a 90-day period after obligation. Interstate discretionary funds permit the department to accelerate

completion of the Interstate system of highways. Bridge discretionary funds facilitate replacement of major structures without using normal federal-aid apportionments.

The division also administers several federal-aid programs that provide funding for cities, counties and rail-highway crossing safety improvements.

The Federal-Aid Urban (FAU) Program provides federal funding for street and highway construction in cities and urban areas with more than 5,000 population. During 1985, approximately \$3,698,000 was obligated to cities

throughout the state for this program. The FAU funds are generally used to finance 75 percent of the cost of eligible projects with local jurisdictions providing the 25 percent matching funds. During the year, 8 projects were approved for construction under this program.

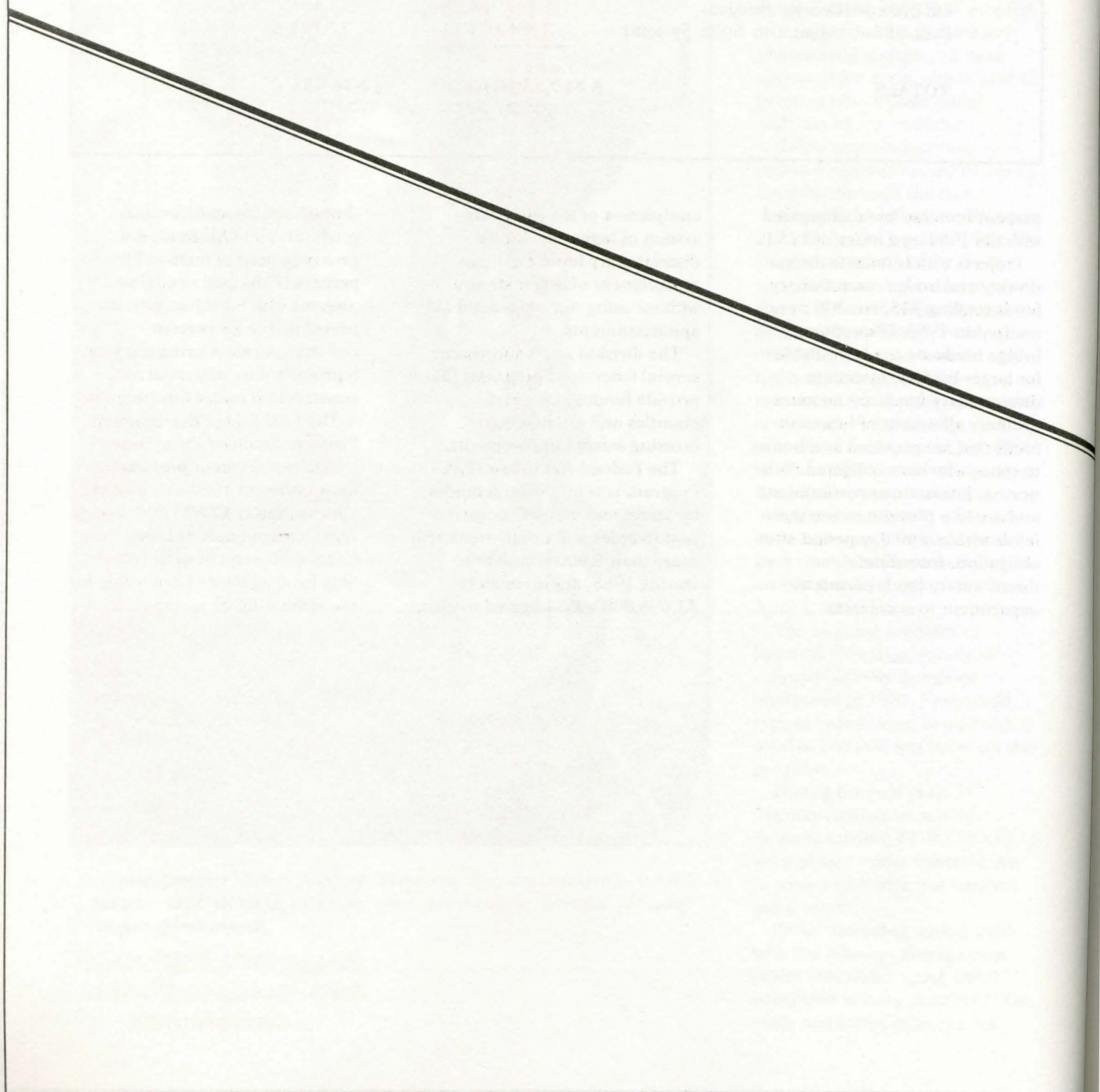
The FAU Bridge Replacement Program financed three large bridge replacement projects in urban areas in 1985 at a cost of approximately \$2,925,000. Bridge replacement funds are used to finance 80 percent of the cost with local agencies responsible for the remaining 20 percent.

Projects & Work for 1988

PROJECTS

WORK

1988



Transportation

**Missouri Highway
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Aviation

Aviation, as an industry, is a major contributor to the economy of the state. As a mode of transportation, it is essential to the movement of millions of Missouri residents each year.

The Aviation Unit actively promotes these values through the development of the industry, the improvement of airports and the education of local governments and individuals.

Personnel of the Aviation Unit are available for information or technical advice to airport sponsors and any others who are interested in the establishment, improvement or promotion of aeronautical facilities.

Aviation provides financial assistance to cities, towns or counties throughout the state through two grant programs. The Capital Improvement Grant Program provides financial assistance to sponsors of publicly owned airports for planning, construction or expansion. Funds under this program are granted on a 50 percent state/50 percent local matching basis.

Under the airport maintenance program, funds may be granted to airport sponsors on a 75 percent state/25 percent local basis for maintenance on runways, taxiways, parking aprons and for emergency repairs. The financing of this program is derived from the unrefunded portion of the motor fuel tax that is applied to aviation gasoline.

A portion of the unrefunded fuel tax is used for the annual publishing and distribution of the Missouri Aeronautical Chart and Airport Directory. Aviation published 7,100 copies of the Missouri Aeronautical Chart and Airport Directory at a cost of \$12,993.

During the year, 56

applications for financial assistance under the airport capital improvement and maintenance programs were received and processed. Aviation provided 11 capital improvement grants for a total of \$143,564 and 13 maintenance grants totaling \$201,111. The \$143,564 in capital improvement grants generated an additional \$3,034,726 in combined local and federal money.

As a result of the Airline Deregulation Act of 1978, the Aviation Unit is active in monitoring the small community Essential Air Service Program that is regulated by the Department of Transportation. A requirement of the act is that all actions affecting the air service to smaller communities must be coordinated with state aviation agencies.

Missouri has a total of 419 airport facilities. These include 355 airports, 58 heliports and six seaplane bases. One hundred fifty-eight are publicly owned, and 261 are privately owned. There are 5,250 active general aviation aircraft and 13,115 active pilots in the state. Eleven airports provide scheduled air transportation and enplaned approximately 12 million passengers in 1985.

Under a contractual agreement with the Federal Aviation Administration (FAA), the aviation unit inspects general aviation airports both publicly and privately owned, throughout the state.

There were 183 airports inspected, 119 of them under the FAA Airport Master Record (5010) Program, and 109 obstruction evaluations were performed during 1985.

The St. Louis Metropolitan Area General Aviation System Plan was completed during 1985. This is the first general aviation system plan done for the St. Louis

Region and was a joint effort of the aviation agencies of Missouri and Illinois, the East-West Gateway Coordinating Council and the FAA. The plan will provide valuable guidance for the future development of the general aviation airports in the St. Louis area.

Third State Economic Development projects were in progress at 14 Missouri airports during 1985. Funds authorized for these projects total \$3,299,821.

Railroads

The purpose of the railroad unit is to provide, maintain or improve rail transportation within Missouri. Railroads administers the following programs: rail planning, rail project implementation and the Amtrak 403(b) program.

In 1985, the rail planning activities program concerned itself with several different items including the following: the collection and tabulation of railroad data to be included in the next scheduled **Rail Plan Update**; the analysis of specific light density lines as possible candidates for rail projects; branch line abandonments; the monitoring and implementation of federal rail legislation; the Santa Fe/Southern Pacific merger; the Conrail purchase; the Milwaukee Road situation; and other general railroad matters.

The rail project implementation program involved both federal and Third State Building Fund monies. The federal monies were used for the following rail projects:

1) Montrose, MO to Appleton City, MO (3.74 miles): This rail project received \$300,000 in discretionary FY 1985 funds for the continuation of a rail renewal

project in southwest Missouri. The project is anticipated to begin during the summer of 1986.

2) Chillicothe, MO to Kelly, MO (37.6 miles): This rail project received \$337,510 in FY 1984 and 1985 entitlement funds to assist in the acquisition and rehabilitation of this short line. The acquisition was consummated in December 1985, while the rehabilitation is anticipated to be completed during the summer of 1986.

The Third State Building Fund monies were used for the following rail projects:

1) Delta, MO to Jackson, MO (18.4 miles): This rail project received \$341,646 in bond issue monies for the rehabilitation of this rail segment. The project was completed in November 1985.

2) Chillicothe, MO to Kelly, MO (37.6 miles): This project received

\$300,000 in bond issue monies for the acquisition/rehabilitation of this rail segment. The acquisition was consummated in December 1985, while the rehabilitation is anticipated to be completed during the summer of 1986.

Missouri provides rail passenger service between St. Louis and Kansas City through participation in the Amtrak 403(b) program. Both the "Ann Rutledge" and the "St. Louis/Kansas City Mules" are funded by a ratio of 65 percent state funding/35 percent Amtrak funding. During 1985, these two trains carried 140,497 passengers.

Other rail passenger activities included the completion of a new Amtrak station at Kansas City, the preparation of route specific advertising that began in January 1986 and the analysis of physical improvements to Amtrak stations

within the St. Louis/Kansas City corridor.

During 1985, the railroads unit also received a \$100,000 high-speed rail grant. This grant, from the Federal Rail Administration, is to be used to conduct a feasibility study for improved conventional or high-speed rail passenger service within the St. Louis/Kansas City corridor.

Transit

The transit section assists in the planning, development and operations of public transit systems and specialized paratransit systems in the state. This function is carried out through administration of state and federal programs relating to general public transportation and specific programs for the elderly and handicapped.

The Missouri Elderly and Handicapped Transportation Assistance Program provides state financial assistance for nonprofit organizations offering transportation services to the elderly and handicapped at below cost rates. In 1985, \$529,878 in state general funds were matched with approximately \$2,054,891 in federal funds to subsidize elderly transportation services.

In addition, \$419,642 in state general funds were matched by \$419,642 in county, city or other local funds to provide essential services for other transportation disadvantaged, especially employees of sheltered workshops. Total transportation funding generated by this program was approximately \$3,400,000. More than 1,620,000 special transit trips were produced through this program.

Transit also administers funds made available by the U.S. Urban

(continued)



Missouri provides rail passenger service between St. Louis and Kansas City through participation in the Amtrak 403(b) program. During 1985, the "Ann Rutledge" and the "St. Louis/Kansas City Mules" carried 140,497 passengers.

Mass Transportation Act (UMTA) of 1964, as amended. Under Section 18, money is available for planning, capital and operating assistance for public transit systems in non-urbanized Missouri areas. There are now 32 operating transit projects in non-urbanized areas of Missouri, an increase from 31 in 1984.

During 1985, \$2,345,082 in federal funds was approved for local capital and operating projects. Federal funds may be used to match local funds for capital purposes on an 80 percent federal/20 percent local basis. Federal funds also may be used to defray 50 percent of a transit system's operating losses. Passenger trips provided in 1985 were more than 2,180,000 compared to 1,780,000 in 1984.

Section 9 of the UMTA provides federal formula capital and operating assistance to transit systems in urbanized areas (more than 50,000 in population). The department administers this program for Columbia, Springfield, St. Joseph and Joplin. In 1985, the department approved \$2,575,754 in federal aid to the transit systems in Columbia, Springfield and St. Joseph.

Capital assistance to non-profit organizations giving transportation service to the elderly and handicapped is provided by Section 16(b)(2) of the UMTA. In 1985, the program provided \$861,127 in federal assistance. This was matched with \$215,282 in local funds for the purchase of 42 vehicles, wheelchair lifts, ramps and similar equipment for 25 elderly and handicapped organizations.

Waterways

Waterways provides technical assistance to Missouri port authorities in promoting private capital investment, in increasing the volume of commerce and in the establishment of a free trade zone within their port districts. Every city or county situated upon a navigable waterway may form a port authority. Eleven port authorities have been formed along the Missouri and Mississippi Rivers. The department is frequently contacted by interested communities concerning the port authority program.

During 1985, the department became involved in the Upper Mississippi River Transportation Economics Study. This study will investigate methods that could improve operating efficiency on our inland waterway system.

Joining the department in this effort are representatives of the departments of transportation from Iowa, Minnesota, Wisconsin and Illinois.

In addition to providing technical assistance, funding was also provided to assist port authorities in the administration of site development. During the year, \$298,800 in grants was spent by nine port authorities and the Bi-State Development Agency, the coordinating agency for the Port of Metropolitan St. Louis. These funds are used by the recipients for managerial, engineering, legal, research, promotion, planning and other non-construction related expenses.

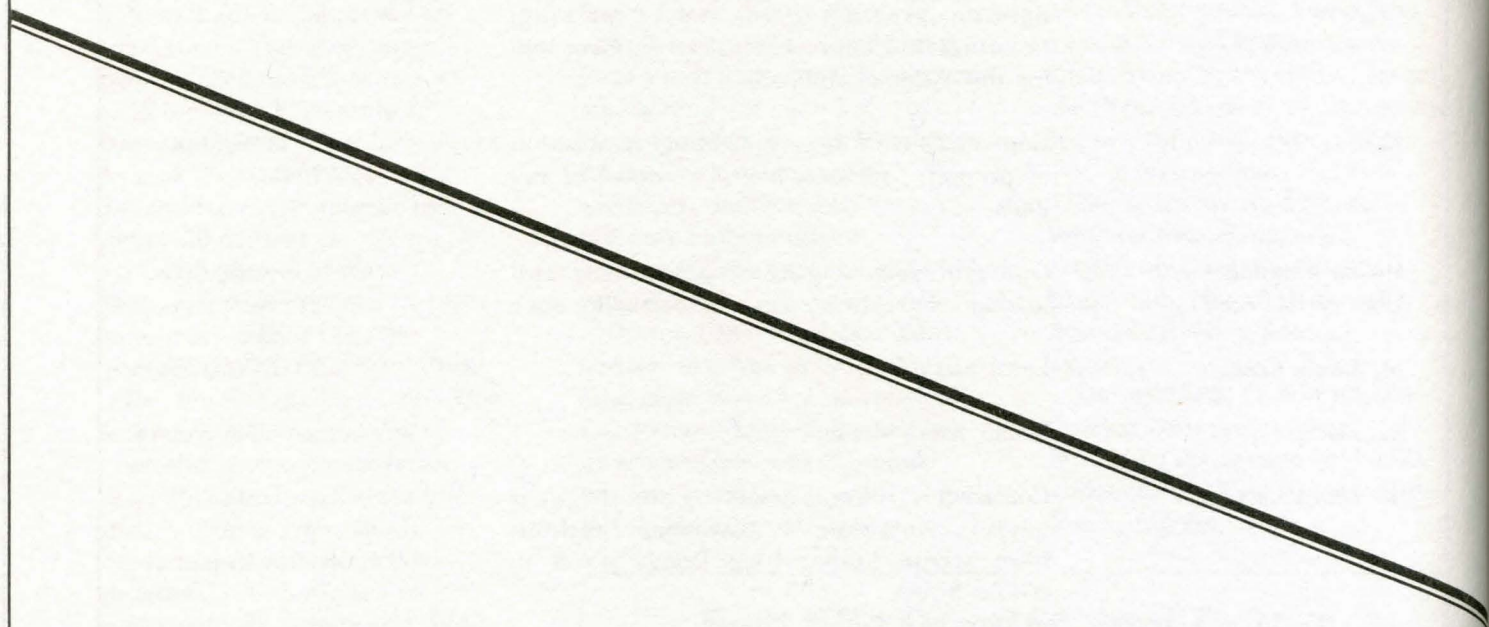
During 1985, 11 port related development projects were funded by the issuance of bonds under the \$600 million statewide bond program.

Port Site Development Grants

PORT AUTHORITY	AMOUNT
Kansas City	\$ 29,000
Howard/Cooper County Regional	28,400
St. Louis County	20,000
St. Louis City	19,000
Bi-State Development Agency	14,000
Jefferson County	18,000
Southeast Missouri Regional	53,000
Mississippi County	25,000
New Madrid County	34,400
Pemiscot County	58,000
TOTAL	\$298,800

Bond Issue Projects

PORT AUTHORITY	PROJECT	AMOUNT
Kansas City	Improvements to existing wharf	\$ 800,000
Kansas City	Site improvements, access improvements, lighting, grading, sewer, water, parking, moorings and improvements to the river wall for the William Mitchell	450,000
Kansas City	Construction of streets, lighting, acquisition of property, relocation and removal of rail lines	850,000
Howard/Cooper County Regional	Construction of grain storage bins and loadout conveyor system to the existing dock	280,000
St. Louis County	Land acquisition	1,000,000
St. Louis City	Recap south dock	780,000
St. Louis City	Construct a pedestrian walkway and riverfront improvements along the Mississippi riverfront from Martin Luther King Bridge north to Biddle Street	500,000
St. Louis City	Construction of an L-dike	2,000,000
St. Louis City	Construct a recreational harbor facility	300,000
New Madrid County	Construction of a warehouse	480,000
Pemiscot County	Construct Phase I of the public dock	<u>200,000</u>
TOTAL		<u><u>\$7,640,000</u></u>



Finances

**Missouri Highway
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Commission**

RECEIPTS

BASIC REVENUE.

Motor Vehicle License	\$152,661,195.07
Motor Bus & Truck Fees	3,653,582.62
Motor Vehicle Use Tax	29,508,854.67
Drivers License Fees	10,422,537.76
Motor Vehicle Inspection Fees	2,091,593.50
Motor Fuel Tax Receipt	165,317,320.74
Vehicle Sales Tax Receipts	52,065,717.81

Subtotal	\$415,720,802.17
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OTHER REVENUE

Miscellaneous Escrow Fees	530,803.18
Reciprocity Fund Interest	287,021.13
Road Fund Interest	9,633,248.86
Other Miscellaneous	9,740,062.94

Subtotal	20,191,136.11
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FEDERAL REIMBURSEMENT

Federal Highway Administration	303,318,666.56
Corps of Engineers	295.24

Subtotal	303,318,961.80
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TRANSPORTATION REVENUE

General Revenue Fund	3,996,979.78
Federal Funds	8,631,125.40
Transportation Trust Fund	525,916.30
Aviation Trust Fund	147,920.19

Subtotal	13,301,941.67
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MISSISSIPPI RIVER PARKWAY COMMISSION

7,770.00

THIRD STATE BUILDING TRUST FUND

2,251,510.24

THIRD STATE BUILDING FUND

2,863,870.22

TOTAL RECEIPTS

\$757,655,992.21

DISBURSEMENTS

CONSTRUCTION		\$460,666,276.09
MAINTENANCE		179,560,733.57
ADMINISTRATION		42,780,484.78
REFUND OF MOTOR & AVIATION FUEL TAX		7,691,130.50
O.A.S.I.		8,506,414.02
TRANSPORTATION FUNCTION		
Administration	779,875.00	
Transit	7,688,586.59	
Rail	2,929,417.13	
Aviation	361,706.95	
Water	314,054.59	
Subtotal		12,073,640.26
MISSISSIPPI RIVER PARKWAY COMMISSION		7,770.00
THIRD STATE BUILDING TRUST FUND		2,251,510.24
THIRD STATE BUILDING FUND		2,863,870.22
OTHER STATE DEPARTMENTS		99,278,720.37
TOTAL DISBURSEMENTS		<u>\$815,680,550.05</u>

MoDOT Library



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